CW Report

Chemical Week

July 23, 1955

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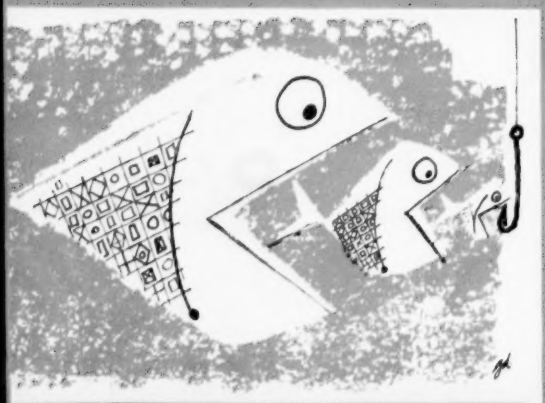

More and more firms are now using tried techniques of setting out 'bait' to catch ideas . . p. 39

Properties are different—and some of them are better—in radiation-catalyzed polymers . . . . . p. 52

There's money to be made in animal repellents—to protect people, crops, furnishings . p. 58

Too much urea? New makers enter field, capacity grows, but demand also rises . . . . . p. 77

Sell 'em where they cluster—that's philosophy of Du Pont's trade exhibit section . . . . . p. 82

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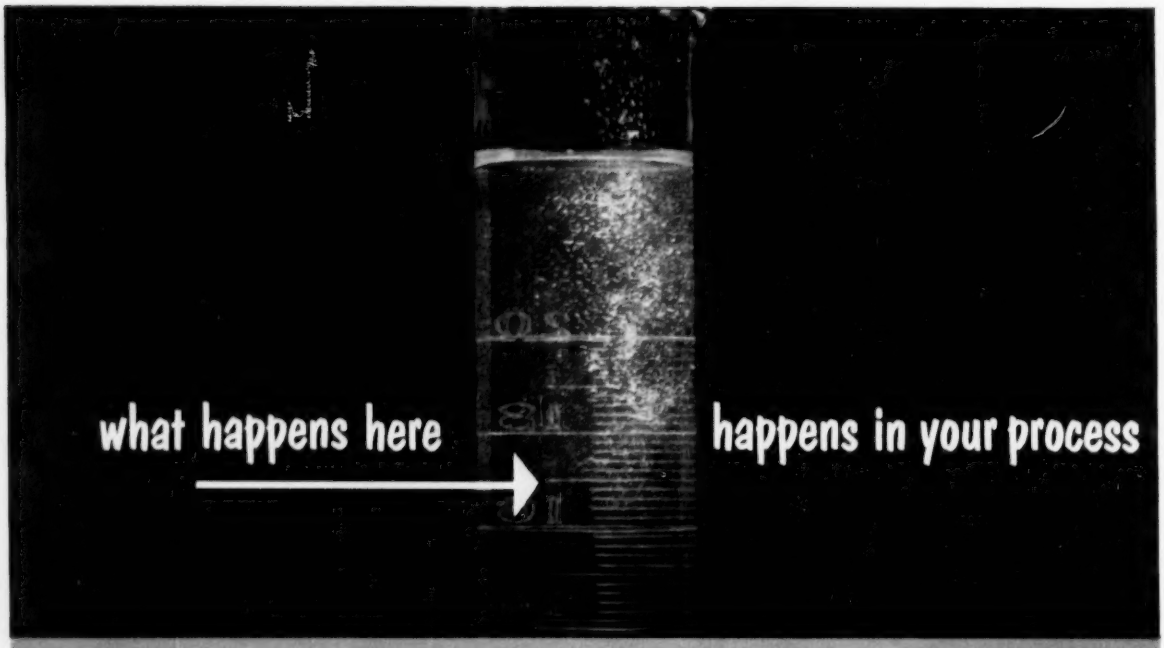

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All in all, it's an excellent money value for users from the Mississippi Valley to the Panhandle to the Pacific. If we aren't already supplying your needs in our shipping area, we'd like to quote. May we?

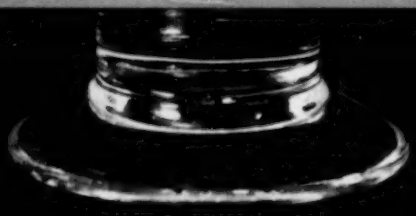

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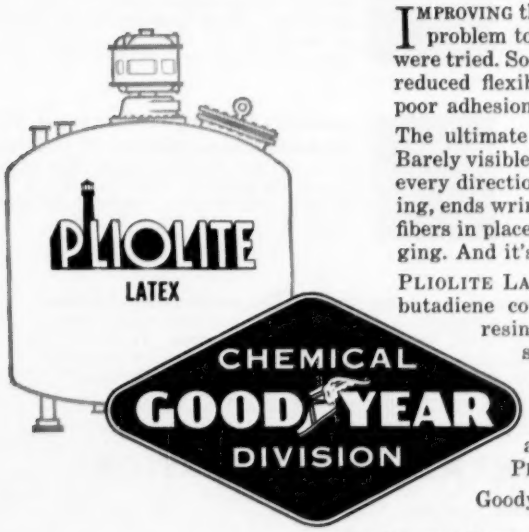
Photo Courtesy of Burlington Decorative Fabric Associates, Burlington Industries, Inc.

Now—liquid muscles for decorative fabrics!



IMPROVING the performance of decorative fabrics has long been a problem to their manufacturers. Many types of undercoatings were tried. Some improved strength and durability, but brittle feel, reduced flexibility and resilience, high cost, objectionable odor, poor adhesion and lack of permanence were added problems.

The ultimate solution was a coating based on PLIOLITE LATEX. Barely visible, this lightweight, odorless backing muscles fabrics in every direction, permits them to retain shape after severe stretching, ends wrinkling. It also improves body and drape and binds the fibers in place, increasing resistance to raveling, tearing and snagging. And it's permanent!

PLIOLITE LATEX is the family name for a series of styrene-butadiene copolymer dispersions, ranging from elastomeric to resinous in nature. These latices in the form of saturants, sizes, finishes, coatings, inks and adhesives are doing much to improve appearance and durability of textile, paper, leather and rubber products. What can you do with the strength, flexibility, permanence and resistance to chemicals, abrasion and aging of a PLIOLITE LATEX? For details, write:

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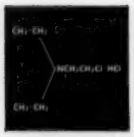

beta-Diethylaminoethyl Chloride Hydrochloride. (DEC). $(CH_3CH_2)_2\ NCH_2CH_2Cl.\ HCl$. A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the production of antispasmodic agents and other pharmaceuticals.

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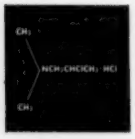

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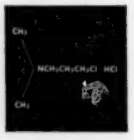

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Other widely used intermediates supplied by Michigan Chemical Corporation include Hydrobromic Acid, Methyl Bromide, Ethyl Bromide, Monobromobenzene, Trimethylene Chlorobromide, Phosphorous Tribromide and Cyclopentyl Bromide. Write for booklet "Individualized Intermediates."

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Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

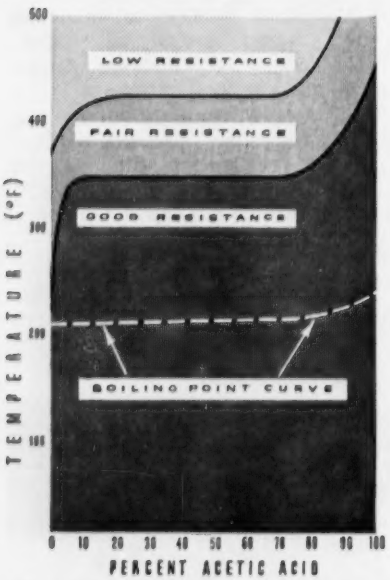
Published by The Pfaudler Co., Rochester, N.Y.

NOW . . . process acetic acid in vessels guaranteed against corrosion

Here is another of the many acids against which Pfaudler glassed steel is guaranteed. If you have a process in which acetic acid is the principal corrosive, you should take advantage of this protection.

The unusual new one-year corrosion guarantee now offered by Pfaudler covers acid-alkali-resistant glassed steel reactors and other vessels for handling corrosive products.

We issue this guarantee for services where field and test data have proved that glassed steel will resist chemical attack. Naturally, we estimate service life on guaranteed units to be much longer than one year — usually 5 to 15.



The guide chart shown here is based on the use of pure acetic acid 24 hours a day, 365 days a year . . . a more severe test than would normally be encountered in field service.

Long service life

Terms of the guarantee provide for free on-the-spot repairs, or factory repairs if necessary (on an F.O.B. factory basis), of any acid-alkali-resistant glassed steel vessel which becomes unusable as a result of corrosion. The guarantee remains in full force until one year from date of shipment, provided your processing conditions do not exceed the operating range agreed upon at time of sale.

It is important to note that, even for services where glassed steel cannot be guaranteed, it may still give adequate and economical service life.

Acetic acid is just part of our story dramatizing how Pfaudler glassed steel saves you money. Perhaps you have a process which can operate more economically and efficiently with the greater corrosion resistance of glassed steel. Write us, or consult your Pfaudler representative for further details.

This Dramatic Guarantee

is now provided on equipment for use with a number of corrosives.

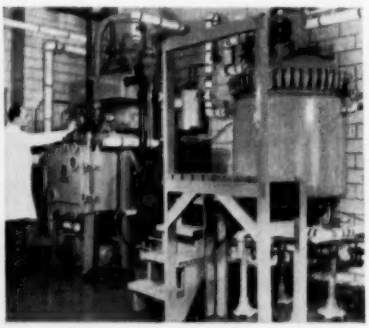
To learn more about the application of glassed steel equipment for *your* process, write our Rochester office.

4 days' drying done in 7 hours

A large manufacturer has been using the new Pfaudler glassed steel conical dryer-blender on a tough job — drying a corrosive product containing acid halides. This job took 4 or 5 days under previous methods.

Their engineers report that the new Pfaudler design has reduced this drying time to 6 or 7 *hours!*

Data on this glassed steel unit is now being offered to all processors interested in reducing drying or blending time. Write The Pfaudler Co., Rochester, N. Y.



How would *you* guard product purity in a lab like this?

The equipment you see here gets to do all kinds of jobs. It's in the Biochemistry Development Laboratory at Sterling-Winthrop Research Institute, Rensselaer, N. Y.

Projects at the Institute include monumental tasks like producing antipernicious anemia principle — it takes a ton of beef livers and a 40-hour week to produce 1/30,000 of an ounce!

As you can imagine, maintaining purity of the product is extremely important. That's why reactions are carried out in a Pfaudler 100-gallon glassed steel kettle (right). This vessel not only seals out outside impurities, but also prevents metallic contamination. Its hard, smooth surface cleans thoroughly and easily.

If you've a problem of maintaining product purity, perhaps you can find an excellent answer in the chemical inertness of glassed steel by Pfaudler.

Nonsticking "utility" pipe costs less

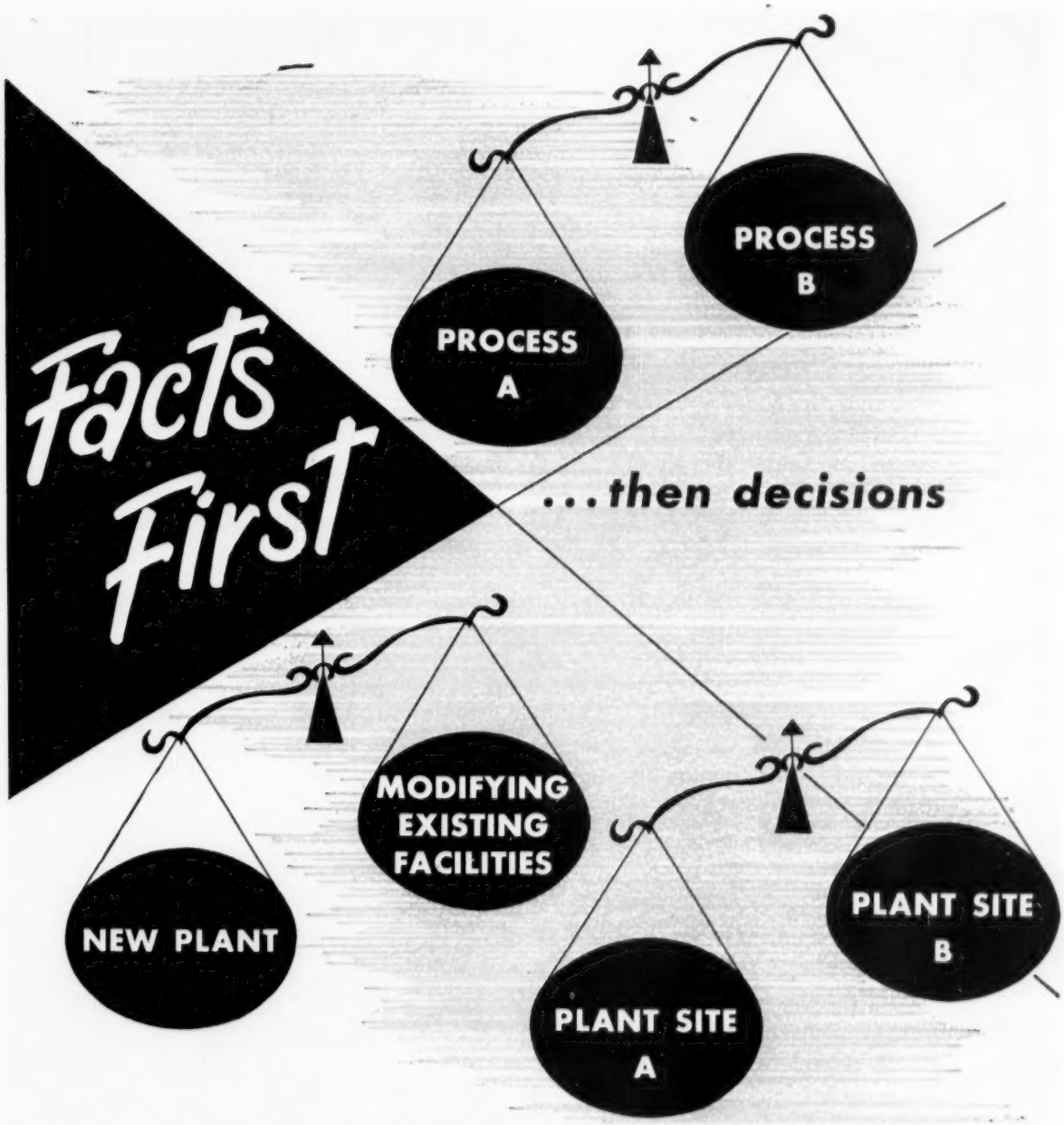
We don't know exactly how much you are now paying per foot for the growing network of piping in your plant, but we may be able to save you money on first costs *and* cleaning costs.

Because neither glass nor steel is a very costly material to start with, we are able to produce glassed steel "utility" pipe, at a low price that can often save hundreds of dollars on an installation.

Advantages of this pipe are the inherent advantages of glassed steel: NONSTICKING: there are practically no products that can stick to glass very strongly; EASY TO CLEAN: smooth, shimmering surface can often be cleaned just by flushing pipe; DURABLE: the outside of the pipe is good, rugged carbon steel. To keep cost low, a glass of mild chemical resistance is used, providing moderate resistivity.

You can now purchase this pipe in lengths up to 10 feet, in diameters of 2″, 3″, and 4″. *Two styles are available:* conventional type flanged pipe, which is joined by split flanges; or specially designed jointed type for cutting to size and fitting the pipe in your plant.

WRITE, WIRE OR PHONE for competent guidance in selection of corrosion-resistant processing equipment. Because Pfaudler handles a wide variety of materials, our corrosioneers can give you a practical, unbiased choice of materials and designs.



Planning to invest large sums in a new plant to manufacture certain products . . . if the evidence indicates it would be profitable?

You will need facts.

Obviously many questions must be raised and reliable answers found before you can make the big No. 1 decision. Your own organization can uncover many of the needed facts. Some work, however, might be handled better by an experienced independent organization. Or such an organization could be used to check important findings of your own.

Here, we can be of service.

We know many processes thoroughly. We know comparative costs and relative merits of competitive processes. We are keenly aware of new developments—both domestic and foreign—in products and probable trends in marketing objectives.

A member of our staff, experienced along such investigating lines, will be glad to discuss your plans in confidence, if you feel we can be of service. A preliminary discussion, of course, does not obligate you in any way.

Engineering

Design and Construction of Process Plants

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Design and Construction of Process Units

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Process Evaluations

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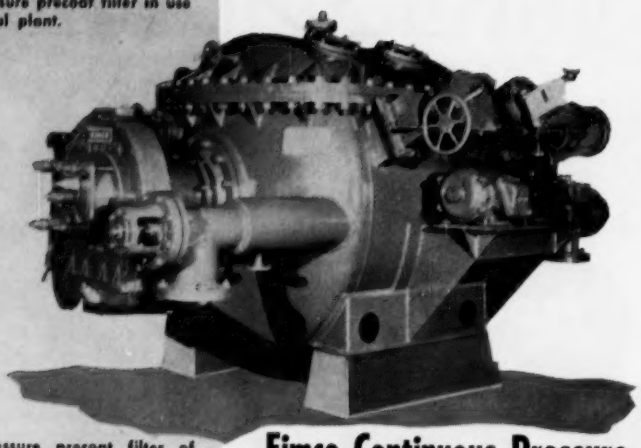
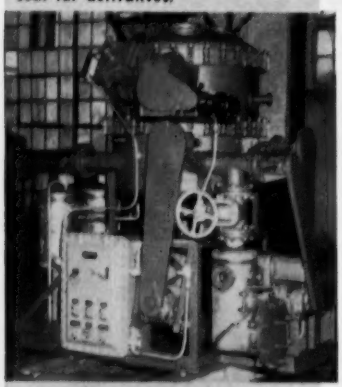
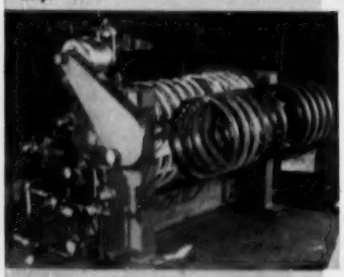
Eimco pressure precoat filter in use by chemical plant.



Eimco pressure precoat filter of laboratory size used in research on coal tar derivatives.



Eimco Burwell plate and frame pressure filter with fully automatic cycle equipment. All operating functions including: feed, wash, blow, precoating, opening, changing frames and closing are accomplished mechanically and automatically.



Eimco Continuous Pressure Filters Open New Processing Fields.

Eimco's experience in specialized filtration problems make them the natural leader in seeking out new fields in which the application of vacuum and pressure filtration can work for the benefit of industry.

Many of the top producers in metallurgical, chemical, food and pharmaceutical materials have cooperated by pooling their experience with Eimco engineers at the Eimco Research and Development Center to develop new equipment and new methods for processing on an economical basis many of the products that have never before been available to the general public.

Filtration problems submitted to Eimco Research and Development Center receive individual attention and the best, most economical method with a complete analytical report will be made directly and confidentially to the client.

Eimco, alone, makes all types of commercial production vacuum and pressure filtration equipment and Eimco's interest is only in recommending the best method and equipment consistent with the requirements at the operation.

Write Eimco for complete information on continuous vacuum and pressure filtration equipment for your process.

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B-132

OPINION . . .

Ozone—Dioxide

To THE EDITOR: My attention has been drawn to your excellent news article dealing with the economics of ozone.

It presents the position of ozone in a very able manner, and the comparison with other oxidizing agents in the table is quite accurate with one exception. The cost of chlorine dioxide is not 98¢/lb. as shown in the table, but 20¢/lb. as prepared in pulp mills from sodium chlorate. This means that the cost of chlorine dioxide on an equivalent oxidizing power basis is 11.1¢/lb. of ozone, which compares favorably with the 10-15¢/lb. figure given for the cost of ozone.

This also places chlorine dioxide in quite a different position on the chart. It should be in a black block, between the two figures given for nitric acid (38°Be).

Possibly the 98¢/lb. cost for chlorine dioxide was based on producing it from sodium chlorite. However, for all larger-scale uses, chlorine dioxide is made from sodium chlorate by one of six methods described in a paper by the writer in TAPPI, Vol. 37, No. 4, April, '54, p. 129. . . .

W. HOWARD RAPSON
Professor of Chemical Engineering
University of Toronto
Toronto, Canada

Good point. Some mills do generate their own chlorine dioxide from sodium chlorate in specially installed units. How such units are charged off determines the dioxide cost—and that can vary widely.

As a marketable commodity, chlorine dioxide is normally made from sodium chlorite; that's why we used the 98¢ figure.—ED.

DATES AHEAD . . .

American Soybean Assn., Natl. Soybean Processors Assn., joint meeting, Netherlands Plaza Hotel, Cincinnati, Aug. 29-31.

National Agricultural Chemicals Assn., annual meeting, Essex and Sussex Hotel, Spring Lake, N.J., Sept. 7-9.

Federal Wholesale Druggists Assn., annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., Sept. 11-14.

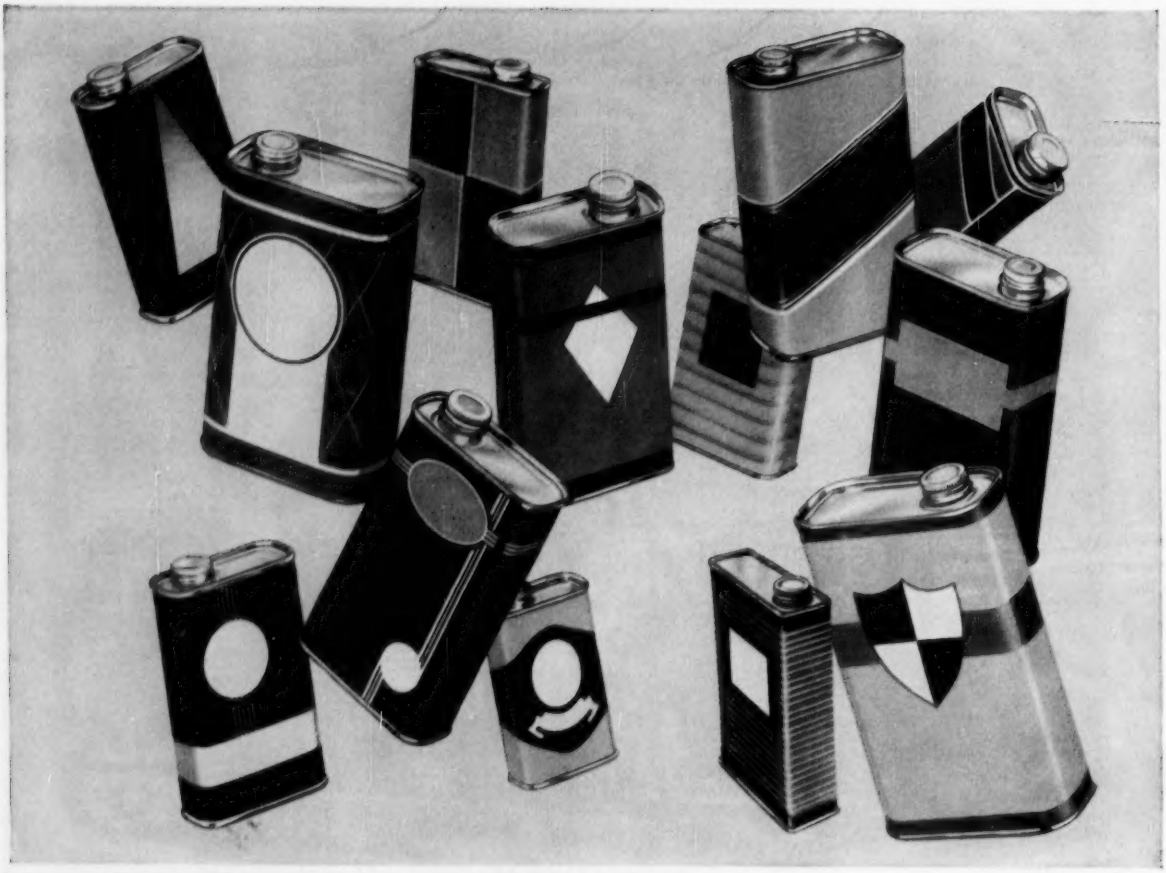
American Chemical Society, 128th national meeting, Minneapolis, Minn., Sept. 11-16.

destination **STEEL PLANT U. S. A.**

The steel industry — a consumer of Sulphuric Acid by the tank car — depends upon prompt shipments to supply 'pickling' requirements. Stauffer, experienced in supplying both giant and "Tom Thumb" industries, maintains a constant flow of tonnage shipments to numerous steel plants, petroleum refiners, fertilizer manufacturers, and other users of this workhorse chemical.

Coordinating on-time deliveries of over 50 heavy chemicals—30,000 tons are shipped weekly from Stauffer and subsidiary companies — to all industries is an integral part of Stauffer's coast-to-coast service. **STAUFFER CHEMICAL COMPANY, 380 MADISON AVENUE, NEW YORK 17, N. Y., sales offices in principal cities.**

STAUFFER Stauffer CHEMICALS SINCE 1885 **CHEMICALS**



Continental "F" style cans forecast a sunny future

Today, almost every producer of waxes, polishes, oils, etc., packages in "F" style cans. With Continental "F" styles, however, you can look forward to more than sturdiness and convenience. Colorfully lithographed by master craftsmen, these rugged containers give your product a bright competitive edge on crowded supermarket shelves.

In addition, Continental spares no effort to make Tailor-Made Package Service as appealing as "F" style cans themselves. Whatever size you choose, from four-ounce to gallon, we'll deliver just the quantity you want, just when you want them. And like our packages, research and engineering tailored precisely to your needs are always available.

Let us show you the sunny sales future that "F" style cans offer your chemical products. Call anytime.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

NEWSLETTER

Fast tax writeoffs—responsible in part for the mighty expansion in the chemical process industries over the past few years—now appear to be in for a severe setback.

This week the entire program is being seriously debated within top-echelon government (the cabinet-level Defense Mobilization Board), and there's every indication that Treasury Secretary Humphrey's view—that too much tax revenue is at stake to permit continuation—will fall on receptive ears.

Humphrey estimates that this year alone the government will lose $980 million because of the five-year writeoff; he maintains that this is a dangerous matter while defense spending stays high and budget-balancing gets more difficult.

•

What any substantial cutback in fast depreciation would mean to chemical companies can be calculated from late statistics on expansion under the rapid amortization program.

Over 1,040 chemical and allied projects—worth more than $2.9 billion—have been certified to date; that's some 10% of all industry expansion under accelerated amortization.

At the turn of the year, $2 billions' worth of new projects was complete; in 1955, $752 millions' worth of additional facilities will go into operation.

•

Only real hope left to jolt Humphrey's position: the Office of Defense Mobilization's comprehensive review of all expansion goals in the light of future mobilization requirements.

If this survey shows that there are still important gaps in the mobilization base, it's conceivable that some chemical firms will be offered the incentive of rapid amortization to fill in the chinks.

But these categories will be carefully limited—probably to direct defense suppliers.

•

The Federal Trade Commission is equally adamant this week, is again training its antimerger guns on paper activities with a three-pronged charge against Union Bag & Paper Corp. and Hankins Container Co.

FTC charges the purchase of 25,000 shares of Hankins' common stock by Union last year (along with several collateral agreements) lessens competition in manufacture and sale of corrugated boxes and sheets, violates the law against interlocking directorships, and violates the FTC Act.

•

"Hadacol" again? In another charge, FTC taps the Leblanc Medicine Co. with false and exaggerated claims for the power of Kary-On—a vitamin-mineral supplement—to relieve or cure suffering.

The commission last year dismissed similar charges against the predecessor firm, Leblanc Corp., for misleading advertising of Hadacol, because that company was bankrupt.

More chlorine capacity for Kansas would appear likely this week as Frontier Chemical Co. heads into a $6-million expansion program.

According to present plans, Frontier will immediately take steps to double chlorine production at its Wichita, Kan., plant, will also put in units to turn out carbon tetrachloride, and other components of antifreeze compounds, cleaners and paint strippers.

•

Likewise broadening its product base is Shawinigan Resins Corp., which will build a $1-million polyvinyl alcohol plant at Springfield, Mass. Its process was developed in cooperation with Shawinigan Chemical Co. of Canada; capacity will be over a million lbs./year.

•

Texas Butadiene & Chemical Corp. also would seem to be making progress with its plans to build a butadiene plant on the San Jacinto River outside Houston, Tex. Preliminary consulting work on the project has been completed; the Missouri Pacific Railroad has started work on a three-mile spur line from its Baytown, Tex., line to Texas Butadiene's plant site.

•

Industrial use of atomic energy is attracting a host of new entries these days. Among the chemical process and equipment companies now granted "access permits" to use restricted nuclear technology data: American Metal, American Potash & Chemical, Atlantic Refining, Blaw-Knox, Champion Paper & Fibre, Chemical Associates, Electro Metallurgical Co. (division of Union Carbide and Carbon), Olin Mathieson, Minnesota Mining & Mfg., Owens-Illinois Glass, Speer Carbon, Standard Oil (Ohio), and U. S. Rubber.

•

Another effort was made last week to put Florida phosphate plant wages on a substantially higher plane next year. Local 377, AFL Chemical Workers, has boosted its wage increase demand from 8.5¢ to 15¢/hour. Apparently conscious of the recent steel wage rise, local President M. B. Martindale says his new bid is based on "recent wage increases granted in the North."

•

Automation, employment, personnel displacement and labor productivity in modern industry are to be studied next fall by Rep. Wright Patman's subcommittee of the Joint Congressional Committee on the Economic Report. What's going on in chemical process plants—where the equipment-per-worker ratio has long been high—will come up during the week of Oct. 17, when the committee will hear from President Champ Carry of the M. W. Kellogg Co. and Research Director Otto Pragan of the AFL Chemical Workers Union.

•

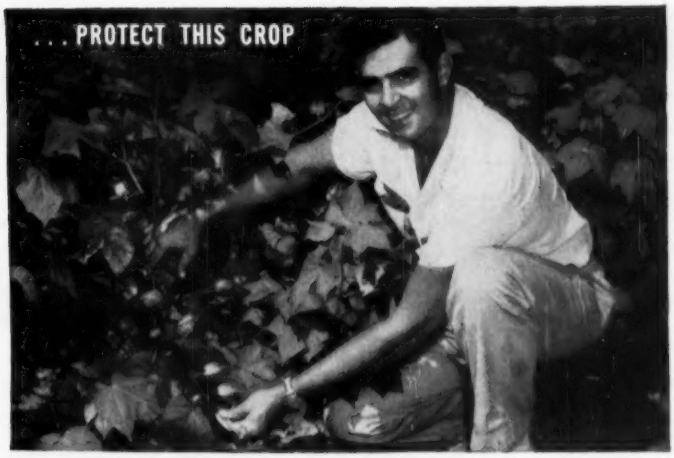
Claims of success for development of a synthetic blood plasma substitute emanate from behind the iron curtain this week.

In the Hematological Center of Bucharest, scientists have come up with a colloidal, macromolecular transparent liquid (called Soldextrin) which is said to maintain its properties for several years, can be injected into the veins regardless of blood groupings, is nontoxic.

•

New and novel is a current police experiment in Singapore: Henceforth the "law" will add red dye—that won't wash off—to the fire-hose water it uses to combat rioters. Once dyed, a rioter will stay dyed, can be easily identified by police officials.

HOW HERCULES HELPS...



TARGET FOR INSECT PESTS—Tender cotton bolls, a delicacy for insect pests, are safeguarded by toxaphene insecticides. Dusts and sprays, based on Hercules toxaphene, are now used all over the world and recommended for the control of more than 200 species of destructive insects.

VERSATILE PAPER—A number of Hercules papermaking chemicals go into the paper cups, plates and napkins that add to outdoor enjoyment. Hercules Kymene®, for example, imparts wet strength to paper products. Additional desirable characteristics are obtained with Pexol® fortified size, Paracol® wax emulsion, or other Hercules sizing ingredients.

NEW ALGICIDE, Hercules Delrad®, effectively controls pestiferous algae in farm ponds, lakes, irrigation canals, and fish rearing ponds. Easy to apply, Delrad not only destroys the algae but causes it to disintegrate, thus preventing dead algae from producing undesirable odors and imparting taste to the water. (Photo courtesy Agricultural Experiment Station, Alabama Polytechnic Institute.)

HERCULES

CHEMICAL MATERIALS FOR INDUSTRY

HERCULES POWDER COMPANY
INCORPORATED

992 Market St., Wilmington 99, Del. Sales Offices in Principal Cities

SYNTHETIC RESINS, CELLULOSE PRODUCTS, CHEMICAL COTTON, TERPENE CHEMICALS, ROSIN AND ROSIN DERIVATIVES, CHLORINATED PRODUCTS, OXYCHEMICALS, EXPLOSIVES, AND OTHER CHEMICAL PROCESSING MATERIALS.

G55-7

"Another product safely shipped in Inland 'protection-eered'* containers"

new babies can be hard to handle

National Chemical & Manufacturing Company had a brand-new packaging problem on their hands when they began pioneering in latex base paints. Leading manufacturers of emulsion paints for many years, their research in latex and alkyd resins gave birth to a whole new family of products under the famous Luminall label. But "just any" container wouldn't provide the protection and long shelf life these unusual paints needed.

They pitched this problem to the chemical packaging experts at Inland Steel Container, their regular suppliers for many years. These specialists put their experience to work, developed a lining formula that passed the most grueling tests. "This new lining solved our problem completely," says Milton Clamage, Vice President in Charge of Sales. "We now ship 8 different types of Luminall paints and sealers in Inland containers. The lining gives perfect protection in shipping, doesn't crack when pails are dented and—what is particularly important in the paint business—provides long shelf life."

Inland Container has the reputation of solving tough shipping problems for all types of products. For the full story on how "protection-eered" steel packaging insures better shipping and cuts costs, write Mr. Robert Boecher, Room 239-A, today.

"It's better to ship in steel"

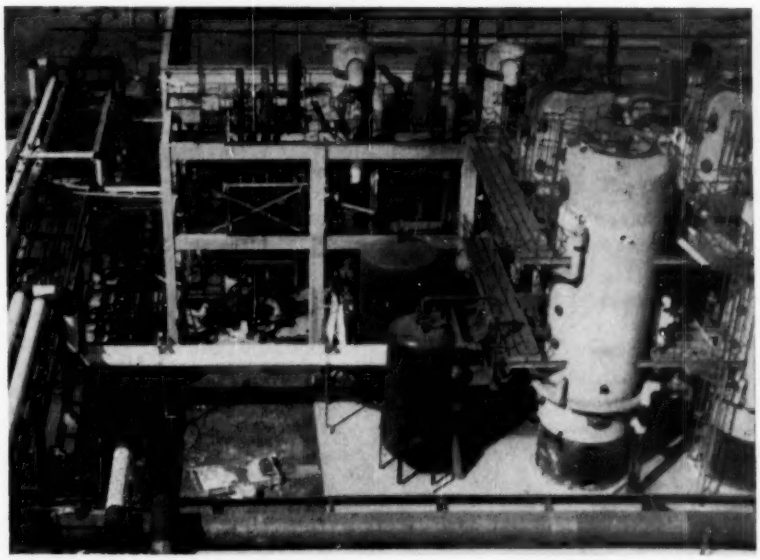
*the right container, with the right lining for your products.

INLAND STEEL CONTAINER COMPANY
Division of Inland Steel Company
6532 South Menard Avenue • Chicago 38, Illinois
Plants: Chicago • Jersey City • New Orleans

July 23, 1955 • Volume 77 • Number 4

Chemical Week

BUSINESS & INDUSTRY. . . .



INSTITUTE, W. VA., GR-S PLANT: Reawakens interest in . . .

Synthetic Tug-of-War

After a week of contradictory predictions, it now looks as if there will be quick action in Congress to permit sale of the government-owned Institute, W. Va., GR-S rubber plant.

To date, two companies have expressed interest in buying the plant, rather than see sale for "other-than-rubber use." And the bulk of interested congressmen are jumping at the opportunity to resolve the ticklish problem—whether to sell (to Carbide and Carbon Chemicals) for dismantling, or continue to underwrite upkeep costs of some $250,000/year.

First to evince interest in taking over the 123,000-long-ton/year plant was Imperial Commodities Corp. (*see box below*). Second was U.S. Rubber.

In talks with government officials, Imperial representatives state that, if they are permitted to purchase the plant, they will install refrigeration and other facilities to adapt the plant to cold GR-S production. They plan to operate, at first, only one of the three lines in the plant, but would keep the others in stand-by condition.

They further claim that they would obtain butadiene raw material from Publicker Industries, which is operating under lease the government butadiene-from-alcohol plant at Louisville, Ky. Its price, they report, would be low enough to allow the plant to compete with Gulf Coast rubber facilities, which use butadiene made from petroleum.*

Money Pressure: The Institute plant is currently in stand-by, and the yearly upkeep cost is sure to loom large in Congressional minds as sale bills are being considered. If sold, the buyer would have to agree to maintain the plant for 10 years, and, if it is not kept up, could be ordered to reimburse the government for putting the plant back in operating condition.

Congressmen, however they may view the sale of a plant to a corporation with definite foreign ties, are frankly hoping that more than one bid will be received—that such companies as Minnesota Mining, and General Tire and Rubber, who were unsuccessful bidders for the Baytown plant, may bid on Institute. Decision on the policy question of foreign ownership then would not have to be made until the proposed sale contract comes back for Congressional review next January.

* Alcohol-butadiene is normally higher in cost, but Publicker reputedly has obtained price concessions on blackstrap molasses—thus allowing it to make its alcohol raw material more cheaply.

Imperial Commodities Corp., registered in California, is one of the largest importers of rubber and tobacco from the Far East, does a large part of its annual business selling to the government's rubber stockpile. Some 80% of its common stock is owned by United Deli Corp., a Dutch corporation with home offices in Amsterdam; the remainder is owned by individuals—all U.S. citizens.

Three-Way Race

Third ammonia plant planned for the Pacific Northwest was revealed last week jointly by Phillips Petroleum Co. and Pacific Northwest Pipeline Corp. Capacity of the plant (to be built in southeastern Washington): 200 tons/day of anhydrous ammonia; company named to handle production: Phillips Pacific Chemical Co.

At last accounting (*see p. 19*), Columbia River Chemicals still plans to build a $12-million plant at Pasco—but construction hasn't yet started, and the company won't be able to meet its original late-1955 onstream date. Further south, at St. Helens, Ore., Consolidated Mining & Smelting Co. holds an option on a riverside site for a proposed ammonia plant to augment sales from its Trail, B.C., units—but again ground hasn't yet been broken.

Phillips Pacific, therefore, may yet get the jump on the Intermountain ammonia market.

Its current plans (made possible by the construction of a long-distance natural-gas line from the San Juan Basin of northwestern New Mexico) are to start production late in 1956, get ammonia to distributors in the area in plenty of time for the 1957 spring fertilizer season.

SITES OF CURRENT CASES: Where chemical process companies learn . . .

Lightning Can Strike Twice

If there's anything to be taken for granted about the product liability problem, it's the unpredictability of when, where, and how often you'll be hit by lawsuits.

Ranging from trifling to grandiose, product liability suits are coming to be more commonplace in all industries; and this week, chemical process companies appear to be getting their share. Current cases are widely distributed geographically (*see map, above*); some of them are "multiples," and others are "repeats."

Three on Vaccine: In Chicago and out in Vallejo, Calif., second and third suits have been filed against Cutter Laboratories, charging negligence in preparation of Salk polio vaccine. The first such suit came in Oakland, Calif., and the plaintiff is asking $100,000 (*CW, June 18, p. 19*); the Chicago litigant demands $400,000; and the Vallejo parents are suing for $100,000 general damages and for special damages to be determined after medical treatment is completed. All three of these suits – still in preliminary stages—are based on contraction of polio following inoculation with Cutter-produced vaccine.

Carbon tetrachloride—which figured in a Pennsylvania case that stands as a landmark in chemical product liability (*CW, Oct. 23, '54, p. 20*)—was the villain in a suit decided last fortnight in Tampa, Fla. There a circuit court jury brought in a $160,000 verdict against Tampa Drug Co. in favor of Mrs. Mary Wait.

Mrs. Wait—mother of three children—had brought suit following the death of her husband, alleging that the death resulted from inhalation of carbon tetrachloride fumes from a product used to clean floors in their home. She asserted that the drug company was guilty of negligence in not putting an "adequate" warning on the label. After a one-week trial, the jury deliberated four hours, awarded less than half the $329,332 damages Mrs. Wait had asked.

'Red Hands' Case: In New York, a decision of potential importance to all chemical specialties makers came in the case of Mr. and Mrs. Joseph Lehner vs Procter & Gamble. Mrs. Lehner had asked for damages on grounds that using Tide detergent had injured her hands, and the trial court had ruled in her favor, holding that P&G was negligent in advertising that Tide was "kind to hands." But last month the appeals court threw that decision out, ordering the lower court to retry the case. Negligence, the upper court said, "can be established only by proof of knowledge by defendant of potential danger to a number of persons in using its product"; and mere redness or chapping of a housewife's hands does not constitute such proof.

A father in Louisville, Ky., is suing the St. Matthews Feed & Seed Store for $25,000 in behalf of his 11-year-old daughter. He says the girl was injured by an insecticide obtained from that store and used to kill flies on a picnic site.

Three other suits are not of the product liability variety, but might be considered near-kin to such cases, from management's standpoint. They are attempts to collect for damages allegedly caused by air pollutants from chemical process plants:

- At Bartow, Fla., a citrus grower is suing International Minerals & Chemical Corp.—operator of a nearby phosphate plant—for $20,000.
- A growing number of residents of Santa Cruz, Calif., are suing Santa Cruz Portland Cement Co. for a total of more than $1 million.
- An attorney at Clarkston, Wash., had sued the Potlach Forest pulp and paper mill for $2,000, including $750 as damage to paint. But when a San Francisco laboratory executive testified that only about 1% of the paint's chalking and cracking could be attributed to smoke from the mill, the jury fixed damages at $7.50.

Ahead on Three Counts

In profits, output, and price of common stocks, French chemical companies today are riding the crest of a wave of prosperity.

Despite somewhat lower prices, France's three largest chemical makers are all showing substantial gains in net profits, ranging from Rhone-Poulenc's 7% improvement (1954 over 1953), through Pechiney's 20% gain to Saint Gobain's startling 25% increase.

Total industry output of chemicals and allied products increased by 16% in 1954 over 1953, continues to grow this year. (First-quarter production in 1955 was running 10% ahead of the comparable quarter the previous year.)

Perhaps even more indicative of the industry's healthier condition: French chemical shares rode out the storm on the Paris Bourse in May considerably better than industry in general, never dropped below their Dec. 31, '54, value.

JUDGE HURLEY: On court-banned Krebiozen book, a tentative reversal.

Disputed Dismissal

Still in doubt this week: whether a Boston publisher will be allowed to print and distribute "Krebiozen: The Great Cancer Mystery," a book billed as an expose of the controversial cancer drug developed by Stevan Durovic.

The uncertainty continued even after Judge Joseph Hurley's decision last fortnight to dismiss the injunction suit that had been brought last spring by Durovic and his associates (*CW, April 23, p. 15*). Reason: the Durovic faction is asking that the temporary restraining order be kept in effect pending an appeal to the Massachusetts Supreme Judicial Court.

The book was written by George Stoddard, who was president of the University of Illinois until the Krebiozen dispute and other factors forced him to resign. Durovic and his supporters—represented by James St. Clair, who served as assistant counsel for the Army in the celebrated Stevens-McCarthy-Schine hearings in Washington last year—contend that the book contains untrue and damaging statements.

Attorney Frank Frederick, speaking for the Beacon Press, argued that preventing publication of a book would be in violation of the Constitution's "free press" amendment. Judge Hurley concluded that he had no power to stop publication, but agreed to consider letting the order stand until the state's high court can act.

Dead Issue This Session

Latest effort of lobbyists for German corporate interests to get payments for such former holdings as Schering and General Aniline & Film has come a cropper.

The House Foreign Affairs Committee last week voted to give up its jurisdiction over four resolutions that provided for such payments. Thereby, the resolutions are now referred to the House Commerce Committee, whose members openly oppose all types of asset return, and it's unlikely they'll even hold hearings this year.

Introduction of the resolutions before the Foreign Affairs Committee had been considered an astute move on the part of German interests (*CW, April 16, p. 15*). A favorable report on asset return would have been valuable horse-trading fodder when the Administration's alien property bill (*CW, June 18, p. 19*) comes up for a hearing in 1956.

Now, however, that's all so much wishful thinking.

Only the dregs remain to be handled before Congress closes up work for the summer.

Alien property officials will be asked to explain the present status of the Interhandel lawsuit (*CW, July 16, p. 14*), since the complaints received refer to "why the present Administration has failed to honor its official agreements in this matter with other countries, particularly with Switzerland." However, there's little doubt that alien property officials will be able to clear up these questions in the senators' minds—quickly.

Dismal Outlook

President Eisenhower's foreign trade liberalization program is in for a severe cutback in Congress this week as the race for adjournment gathers speed.

The customs simplification bill, which cleared the House easily, has run into heavy water in the Senate Finance Committee. And though hearings are completed, it looks now as though the committee will force a compromise on the key provision for assessing duty on imports on the basis of their "export value" rather than their "foreign value."

This export value clause has been heatedly challenged by protectionists

MILLIKIN: On trade liberalization, a hobbling hand.

(led by Sen. Eugene Millikin, R., Colo.) on the ground that it would lead to a slightly lower average duty-paid value for imports, equivalent to a tariff reduction.

In some cases this lower duty-paid value could be reduced as much as 15%. The compromise now in view would exempt these items from the new system of duty evaluation for a transitional period.

Defeat Admitted: The Administration has also abandoned hope of forcing a showdown in Congress this year on the proposed Organization for Trade Cooperation.*

Not only is it now certain that the Senate will refuse to take up the measure this session, but House action is also unlikely.

Eisenhower has consistently insisted that Congressional approval of OTC is essential to avoid a gradual resurgence of the economic nationalism and competitive protectionism that split the world economy after World War I. But the majority of the Senate fails to go along with this reasoning.

Adding up the score, it looks as though all the Administration will get of its trade liberalization program this session will be the watered-down version of the Trade Agreements Act and the Custom Simplification bill. And that's a far cry from its expressed hopes.

* OTC would police the General Agreement on Tariffs and Trade, which embodies the bulk of the free-world tariff and trade agreements negotiated since World War II.

EXPANSION . . . .

Dynamite: Hercules Powder Co. has released plans to expand its Bacchus, Utah, dynamite-producing units at a cost of $2 million.

When construction is completed, the company will terminate dynamite production in Contra Costa County, Calif., and transfer all explosives activities to Utah.

•

Yeast: Completion of all its facilities for manufacturing yeast from spent sulfite liquor is scheduled for late October by Charmin Paper Mills, Green Bay, Wis.

Late in June, the company requested the Committee on Water Pollution (in Green Bay) to extend until Oct. 31 the time for completion of the liquor collection phase of its $3.2-million project.

•

Soda Ash: Brunner Mond Co. of Canada, Ltd., will expand its soda ash facilities at Amherstburg, Ont., at a cost of several million dollars.

Construction starts immediately; completion is expected within 18 months.

•

Plasticizers: Celanese Corp. of America starts work this week on construction of a multimillion-dollar plant at Gallipolis Ferry, W. Va., to produce plasticizers and fire-retardant hydraulic fluids. Among those products scheduled for production: tricresyl phosphate—originally developed and produced by Celanese in 1914.

•

Pentaerythritol: Hercules Powder Co. starts construction immediately of a $6-million plant to produce pentaerythritol.

Scheduled for completion next year, the plant will have a capacity of 24 million lbs. of PE and 100 million lbs./year of formaldehyde—more than doubling Hercules' present output rate.

•

Superphosphates: Western Phosphates, Inc., has developed plans to expand its ammoniated phosphate and triple superphosphate plant capacity at Garfield, Utah. Estimated date of completion: early 1956.

•

Ethanolamine: Dow Chemical of Canada, Ltd., will build a million-dollar ethanolamine plant at Sarnia, Ont. Ethanolamines are used chiefly in gas purification, recovery of hydrogen sulfide and carbon dioxide. The bulk of Canada's requirements have been imported from the U.S.

•

Synthetic Rubber: United Rubber and Chemical Co. entered the synthetic rubber production picture last week when it paid $8,644,000 to the U.S. Treasury for title to the 44,000-ton/year former government-owned GR-S plant at Baytown, Tex.

COMPANIES . . . .

Kaiser Aluminum & Chemical Corp. will redeem its 5% cumulative convertible preferred stock on Aug. 12 at $12/share, plus dividends of 50¢/share.

•

Harshaw Chemical Co. (through its subsidiary, Zinsser & Co., Inc.) has purchased the Pigment Color Division, United Wallpaper, Inc.

All purchased manufacturing and laboratory units will be moved to Zinsser's Hastings-on-Hudson plant on or about Sept. 1.

•

New company incorporations in Dover, Del.:

- Rebel Chemical Co., listing capital stock at $11 million.
- Universal Drilling Mud & Chemical Co., Inc., listing capital stock of $50,000.
- Amos-Val d'Ore Lithium, Ltd., listing capital stock of $200,000.
- Montana Sulphur & Chemical Co., listing authorized capital stock of $100,000.
- Muscle Shoals Electro-chemical Corp., listing authorized capital stock of $133,000.

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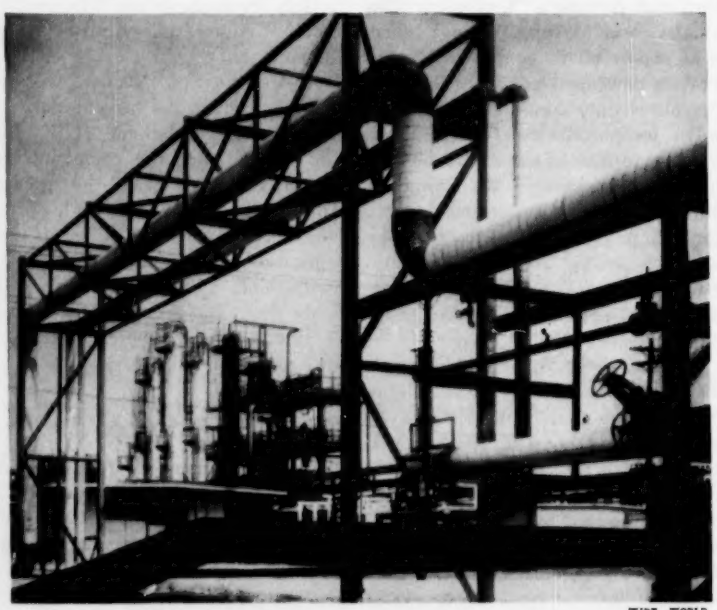
Shea Chemical Corp. has filed articles in Nashville, Tenn., increasing its authorized capital stock to 1,407,000 shares, no par value.



WIDE WORLD

One Year Plus Three Days

DOW CHEMICAL CO.'S 36-million-lb./year synthetic glycerine plant at Freeport, Tex., is taking bows this week on two scores: it's the second synthetic glycerine plant to be built in the U.S., and the first such operation to be built in just one year plus three days.

Consumers include: makers of alkyd resins for enamels; tobacco processors; cellophane, adhesives, explosives and paper producers.

Store and Distribute

your bulk liquids
as the market demands—
with no capital investment

GENERAL AMERICAN TANK STORAGE TERMINALS

a division of GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South LaSalle Street · Chicago 90, Illinois

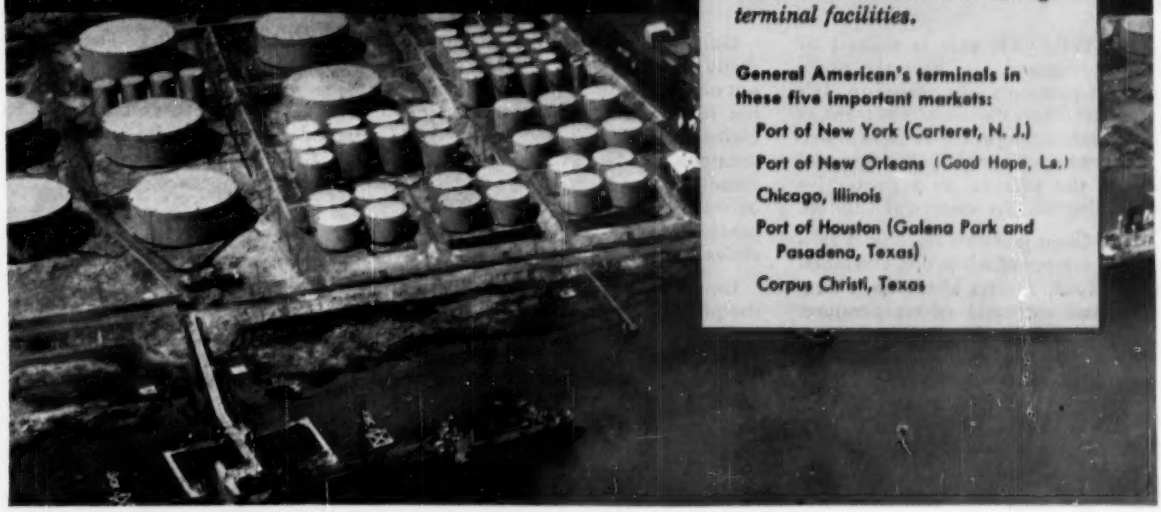
In five important markets, General American offers you complete bulk liquid storage facilities. Many leading shippers and processors have found these facilities add profit when they market their bulk liquids. They can maintain inventories of their products for distribution at the right time and place; gain economies of shipping in bulk; and *conserve* capital.

Modern storage tanks . . . for anything that flows through a pipeline . . . are yours to use. You can be sure of privacy. Carefully guarded manifolds, pipes and pumps to protect your product against contamination. Barrelling, drumming, canning and blending services at New York, New Orleans and Chicago. All this, without capital investment on your part!

Ask about the marketing advantages you receive from leasing General American's tank storage terminal facilities.

General American's terminals in these five important markets:

- Port of New York (Carteret, N. J.)
- Port of New Orleans (Good Hope, La.)
- Chicago, Illinois
- Port of Houston (Galena Park and Pasadena, Texas)
- Corpus Christi, Texas



Another new development using

B. F. Goodrich Chemical *raw materials*

Sealtite Conduit made by The American Brass Company, American Metal Hose Division, Waterbury 20, Conn.

Geon takes sting out of salt problem

WHEREVER salt is mined or processed, you have the problem of preventing corrosion. It's toughest where moisture is present, as in the salt conveyor installation above. That's where Geon polyvinyl material enters the picture, as a protective sheathing on the electrical conduit.

The Geon-jacketed conduit is salt-proof, sun-proof, oil-proof, and moisture-proof, resists abrasion, vibration, and extremes of temperature. Aptly named "Sealtite", it is the first flexible, liquid-tight conduit to receive Underwriters' approval.

Geon resins are basic materials throughout the electrical industry, not only for tough exterior jacketing, but for primary insulation as well. Geon contributes high dielectric strength, resistance to aging, and outstanding flex life—can be submerged in water or buried underground for years without degradation of properties.

Geon polyvinyl materials upgrade the physical and electrical characteristics of many products, step up their sales appeal. There's an easy way to learn how Geon can benefit your own operations. Please write Dept. K-8, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

ACKROYD PHOTOGRAPHY

U.S. ARMY CORPS OF ENGINEERS

TALE OF TWO RIVERS: Willamette bears ocean shipping through Portland; Columbia churns through McNary Dam.

Pair of Aces: Torrents and Tall Timber

Optimism is rampant in the lower Columbia River basin, where hydroelectric power has transformed the old lumbering-fishing-farming economy.

Why the future has luster for chemical process companies: a burgeoning market (industrial, agricultural, residential); the coming of natural gas (next year); and promise of chemical profits from wood waste.

Coursing coldly and swiftly down from the ice fields of the Canadian Rockies, the Columbia River was a big help to the footsore members of the Lewis and Clark expedition as they went water-borne to finish their thrust to the Pacific Ocean 150 years ago; and this tireless stream is still the biggest single asset in the fast-growing industrial economy that centers at Portland, a bustling seaport 100 miles upstream from the Oregon coastline.

The Columbia—largest river on the west side of the Continental Divide, and one of the world's steepest—is a principal reason for the fact that population in this area has been increasing at more than double the national average, and also for the fact that chemical process manufacturing in the basin is similarly booming.

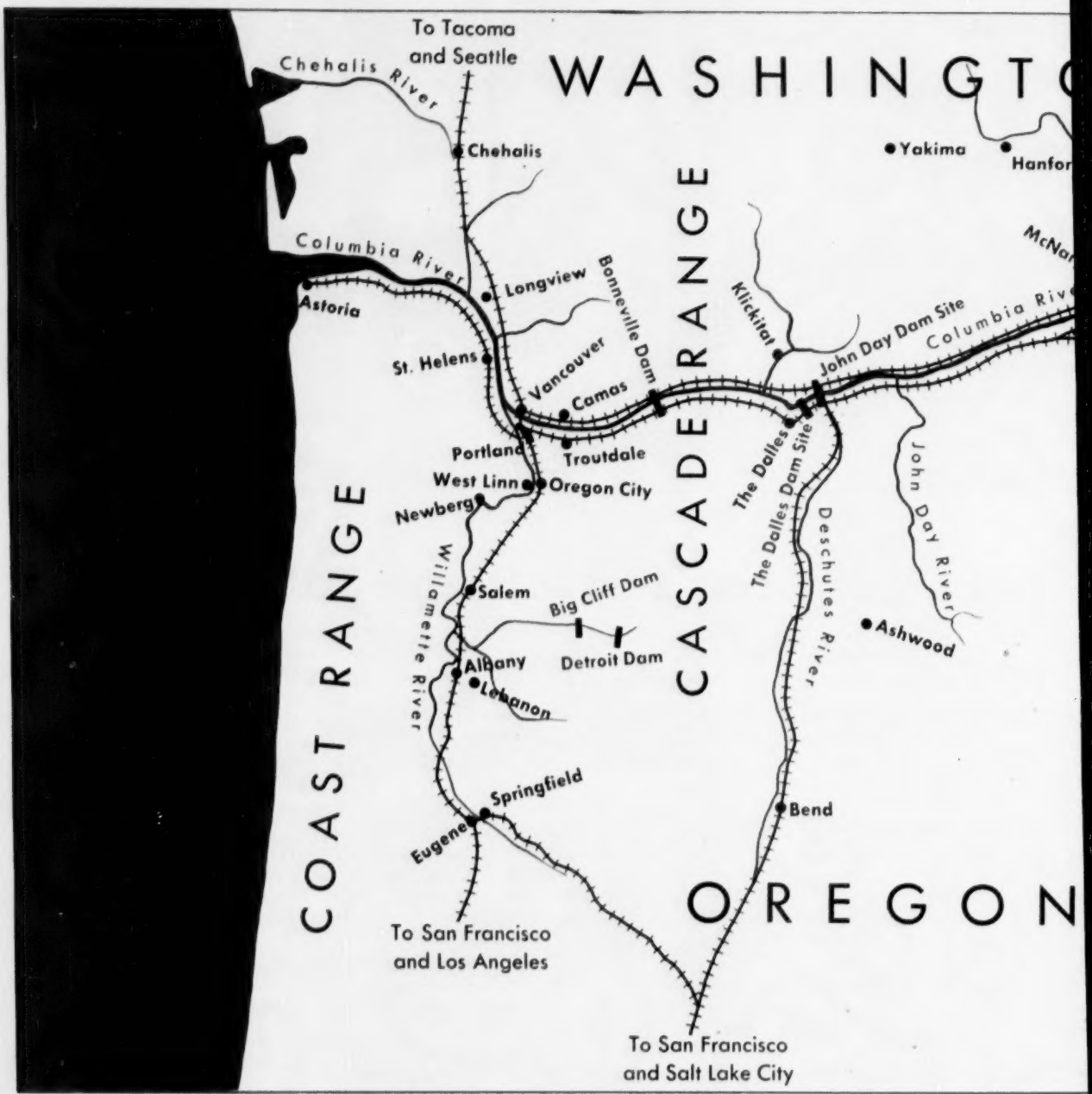
Since the federal government's first big hydroelectric project brought cheap industrial power into the valley in 1939, the Washington-Oregon population has swelled by more than 50% while total U.S. population rose by only 25%. And though the power development program has slackened to a pace that seems sluggish to local boosters, the Columbia and its major tributaries are capable of generating much more low-cost power. It's estimated that Columbia watershed contains more than 35% of all potential hydroelectric power in the U.S.; and less than one-sixth of that Northwest power potential is now being utilized. Besides furnishing power, these streams carry ocean-going barges as far inland as The Dalles, Ore., and smaller vessels up to Eugene, Ore., and Lewiston, Idaho.

By-Products to the Fore: No. 2 factor in the area's economy: the great

MANAGEMENT ON THE MOVE

(Expansion projects planned or under construction)

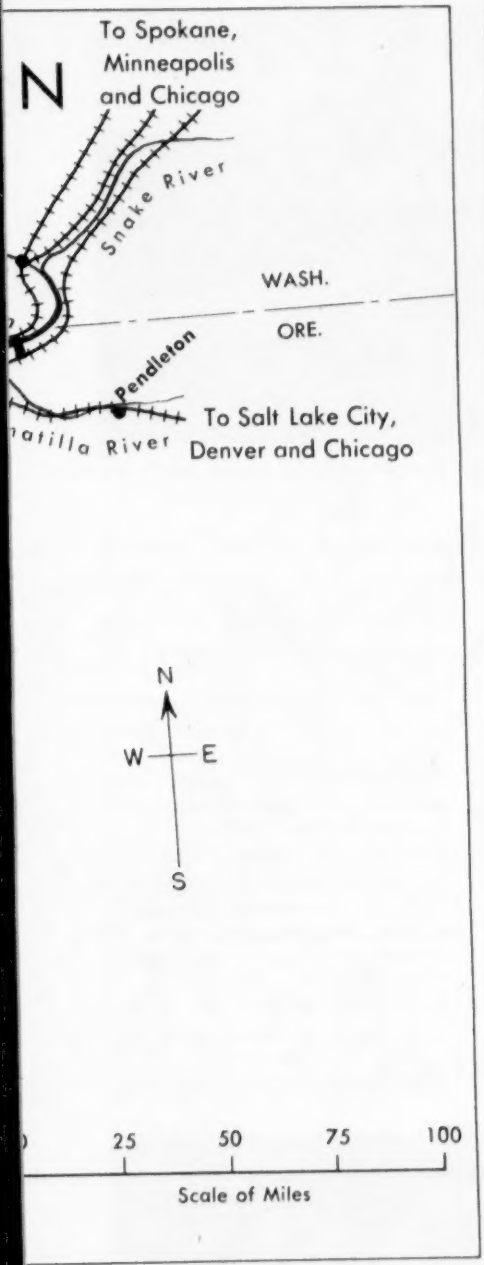
Company	Location	Products	Estimated Cost
Columbia River Chemicals Co.	Pasco, Wash.	Ammonia	$12 million
Consolidated Mining & Smelting Co.	St. Helens, Ore.	Ammonia	———
Crown-Zellerbach Corp.	Camas, Wash.	(Central research)	$ 1 million
Crown-Zellerbach Corp.	Portland (?)	Plywood	$ 2½ million
Crown-Zellerbach Corp.	St. Helens	Paper	$14 million
Harvey Aluminum Sales, Inc.	The Dalles, Ore.	Aluminum	$65 million
Owens-Illinois	———	Glass containers	$ 2 million
Portland Gas & Coke Co.	Portland	Hydrocarbons from oil-gas	$16 million
Weyerhaeuser Timber Co.	Longview Wash.	Chlorine, caustic	———
Weyerhaeuser Timber Co. and Rhinelander Paper Co.	Longview	Paper	———



evergreen forests—Douglas fir west of the Cascade Range, western or *ponderosa* pine to the east. And these are being kept huge through extensive replanting programs. While this sylvan wealth has always been vital to the region, its role has been a changing one.

Lumbering naturally came first, and, since about 1905, Washington and Oregon have been at or near the top of the 48 states in board feet of lumber cut. Lumber is still the basin's biggest cash crop, but pulp and paper mills have been rising in number and importance since the first one went into production beside the Willamette River falls near Oregon City in 1866 (near site of Crown-Zellerbach plant, *see p. 22*). And Oregon ranks first in production of plywood.

Now, timbermen's interest focuses on chemical by-products, which have become increasingly significant in present earnings and future plans of such forest-harvesting giants as Crown-Zellerbach, Weyerhaeuser and Rayonier. They and Oregon State College are carrying on research that has already turned up outlets for wood materials formerly dumped or burned. The U.S. Forest Service and the U.S. Bureau of Mines also have heavy research programs aimed at utilizing what has often been referred to as "the other half of the log." Company



President J. D. Zellerbach; for example, enthuses about lignin, says: "We are making progress—lignin could be the basis for a chemical industry similar to the coal tar-based industries." C-Z is setting up a chemical products division to press this work.

Natural Gas Coming: Of the lower Columbia valley's major primary chemical producers, only one—Portland Gas & Coke Co., chartered nearly a century ago in territorial days—

IN LEWIS & CLARK COUNTRY: MAJOR CHEMICAL PROCESS PLANTS

SOUTHERN WASHINGTON

At Longview:
- Reynolds Metals Co.—ingot aluminum
- Longview Fiber Co.—sulfate and groundwood pulp
- Pacific Paper Board Co.—groundwood pulp
- Weyerhaeuser Timber Co.—sulfite, sulfate and semichemical pulp

At Vancouver:
- Aluminum Co. of America—ingot aluminum
- Becco Chemical Division, Food Machinery & Chemical Corp.—hydrogen peroxide
- Carborundum Co.—silicon carbide
- Columbia River Paper Mills—sulfite pulp
- General Chemical Division, Allied Chemical & Dye Corp.—aluminum sulfate

At Camas:
- Crown Zellerbach Corp.—sulfite, sulfate and groundwood pulp

At Klickitat:
- Gas Ice Corp.—carbon dioxide

At Hanford:
- General Electric Co.—plutonium

NORTHWESTERN OREGON

At St. Helens:
- Fit-Tex Insulating Board Co.—asplund defibrated exploded cellulose
- Crown Zellerbach Corp.—sulfate pulp

At Portland:
- Air Reduction Pacific Co.—acetylene, nitrogen, oxygen
- American-Marietta Co.—phenol-formaldehyde and urea-formaldehyde resins
- Electro-Metallurgical Co. Division, Union Carbide and Carbon Corp.—calcium carbide, calcium oxide, ferrosilicon, ferromanganese and silicomanganese
- Hercules Powder Co. (Paper Makers Chemical Dept.)—rosin size
- Industrial Air Products Co.—acetylene and oxygen
- Krishell Laboratories, Inc.—rare organics and biochemicals
- Linde Air Products Co. Division, Union Carbide and Carbon Corp.—acetylene and oxygen
- Master Chemical Co.—sodium hypochlorite
- McCloskey Varnish Co.—alkyd resins
- M & M Wood Working Co.—phenol-formaldehyde and urea-formaldehyde resins
- National Cylinder Gas Co.—oxygen
- Pacific Adhesives Corp.—protein-blood base glues
- Pacific Carbide & Alloys Co.—calcium carbide and acetylene
- Pennsylvania Salt Mfg. Co. of Washington—caustic, chlorine, chlorates, chloral, DDT, hydrogen, hydrochloric acid, sodium orthosilicate and anhydrous ammonia
- Portland Gas & Coke Co.—benzene, solvent naphtha, creosote, tar, toluene, naphthalene, xylene, soft and hard pitch
- Stauffer Chemical Co.—aluminum sulfate, ground talc and sulfur
- Swift & Co.—adhesives

At West Linn:
- Crown Zellerbach Corp.—sulfite, sulfate and groundwood pulp

At Oregon City:
- Publishers Paper Co.—sulfite and groundwood pulp

At Newberg:
- Spaulding Pulp & Paper Co.—sulfite pulp

At Salem:
- Oregon Pulp & Paper Co.—sulfite pulp

At Albany:
- Western Kraft Co.*—sulfate pulp

At Lebanon:
- Crown Zellerbach Corp.—sulfite, sulfate and groundwood pulp

At Springfield:
- Borden Co. (Chemical Division)—formaldehyde, phenol-formaldehyde and urea-formaldehyde resins
- National Metallurgical Corp.—silicon
- Weyerhaeuser Timber Co.—sulfite, sulfate and semichemical pulp

At Troutdale:
- Reynolds Metals Co.—ingot aluminum

At Ashwood:
- Cordero Mining Co.—mercury

* Plant under construction; scheduled to go onstream Nov. '55

PHOTO-ART WEYERHAEUSER

BACKYARD PEAKS: Electromet and Mt. Hood (11,245 ft.); Weyerhaeuser tree farm and Mt. St. Helens (9,671 ft.).

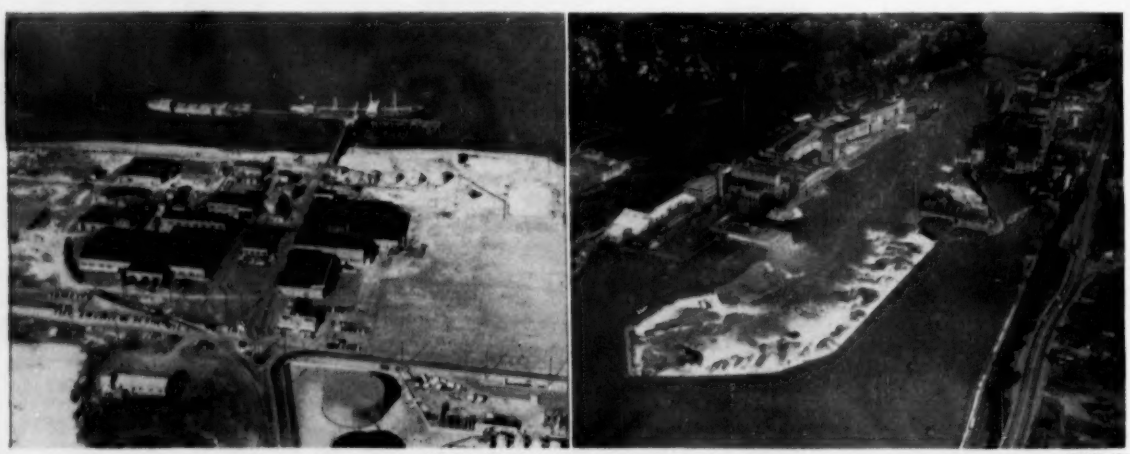
antedates the Bonneville Dam. And even here Bonneville spurred chemical production, because Gasco stepped up making and selling petrochemical by-products so as to cut gas costs and thus meet the challenge of cheap electrical energy.

Last year, Gasco added $4.2 million in by-product sales to its $9.2-million gas sales. And the firm says it fully intends to stay in the chemical business even after it starts retailing natural gas—which it will do as soon as the pipeline from the southwest reaches Portland, possibly late in '56. Gasco President Charles Gueffroy says this operation "offers an opportunity, now being explored, for production of more valuable and more highly refined hydrocarbons."

Other chemical process ventures have come to the region since power became available at less than 2.3 mills/kwh. One of the first to move in was Pennsylvania Salt, which decided on a sodium chlorate plant at Portland as European chlorate sources seemed threatened by war. Pacific Carbide & Alloys and Union Carbide's Electro Metallurgical went there to build calcium carbide works, the only ones in the West. Carborundum began producing silicon carbide at Vancouver, Wash., in 1949, and Food Machinery & Chemical's Becco Chemical Division went onstream in '52 with a hydrogen peroxide plant.

Metals Still Starred: It was aluminum, of course, that first capitalized on Bonneville Power Administration's cut-rate energy; and aluminum reduction is still a star performer in the valley's industrial drama. Aluminum Co. of America poured its first ingot at Vancouver, Wash., late in 1940, and Reynolds started up at Longview just 11 months later. Other metals in production or for which economic processes are being sought: nickel, iron, mercury, chromium, molybdenum, bismuth, columbium, tantalum and plutonium for the Atomic Energy Commission.

To some extent, industrial production has suffered because of power shortages during dry periods, and some industrial expansion plans have been dropped because hydroelectric development hasn't been rushed as much as many persons would like. Still, the BPA network is scheduled to pick up 256,000 kw. this September from the first four of the 16 planned generators at Chief Joseph Dam, and another 700,000 kw. by Dec. '56 when McNary Dam is completed. The Dalles Dam is under construction, the John Day and Priest Rapid dams will be built later.



ACKROYD PHOTOGRAPHY PHOTO-ART

NEIGHBORS ON WILLAMETTE: Pennsalt (left) at Portland barges chlorine to Crown-Zellerbach at West Linn.

and each of these will ultimately add about 1.5 million kw. to the grid. Over its first 17 years, BPA industrial rates have averaged 2.27 mills/kwh.; it appears that by 1957 the charge for industrial power will stabilize at about 3 mills.

Pacific Northwest Pipeline Co. has started construction of its pipeline from the San Juan Basin in southwest Colorado, and is also asking the Federal Power Commission to approve a plan for importing natural gas from Canada to supplement the San Juan supply (*CW, Dec. 25, '54, p. 15*). Portland Gas & Coke's Executive Vice-President James Bell tells *CW* that his firm will have the resale price range for natural gas on an interruptible basis at 30-33¢/1,000 cu. ft.—possibly low enough to permit use as a petrochemical raw material.

When its economy rested only on lumbering, fishing, and dry-land farming, the area had little attraction for chemical concerns. But with all the changes that have come since the first switch was thrown at Bonneville Dam, chemical industry prospects here have altered radically. As of this week, probably no other community in the U.S. is more confident that it holds a winning hand in the contest for industrial growth: an apparently unending supply of good timber, and torrents of water for low-cost power, economical transportation, and industrial use.

Portland's Chemical Potential

According to the Industries Development Dept. of the Portland Chamber of Commerce, these chemical products "could and should" be made in that city:

Acetic acid—acetone—acetylene derivatives—ethyl alcohol—alumina — ammonia — ammonium sulfate—baking powder—

Calcium cyanamide—carbon bisulfide—carbon tetrachloride—cellophane — cellulose acetate products—dry ice—

Dyes and intermediates—enamels and frits—ferro alloys—firebrick and refractories—glycerine — glues — hydrogen — ink—melamine resin—

Methanol—nitric acid—paints — phenol — phenolic resins — phosphoric acid—photographic chemicals—rayon—white lead.

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SIDNEY ROSS CO.'S MEJORAL: Battling Bayer for first place in the Latin-American aspirin market.

Hot Race Gets Hotter

When any product of high profit margin becomes the object of international competition, there's bound to be a cat-and-dog fight. But when the product's a proprietary drug, and the battleground is South America, the sparks really start to fly.

That's how it is this week with aspirin.

The Latins, notorious aspirin gluttons, are under three-sided bombardment: from the government-run pharmaceutical industries (which took over the brandname Bayer during the war); from U.S.-owned firms (plugging Mejoral, Geniol, and a dozen other products); and from Farbenfabriken Bayer (which wants to wrench back its prewar top position).

But unlike the situation that exists in other sectors of the world, Latin America has certain peculiarities that make the struggle especially deadly.

• Due to the low living standard in vast sections of the continent, the big race is on to turn out large-size tablets packed two to an envelope, selling for less than ½¢/package.

• In most South American countries, government permission must be obtained before any foreign-owned company can build a plant or expand current production.

• Fearing the tremendous gains American-owned firms have made in recent years, several South American governments have been openly courting the re-emergence of Farbenfabriken Bayer. Result: hushed-up trading agreements between the other U.S. companies, and a state of intrigue and counter-intrigue.

Heady Prize: How lucrative the aspirin market really is can be seen in the annual consumption figures of just one country, Argentina. Overall annual consumption runs over a billion tablets (500,000 kg.); the average citizen consumes over 50 tablets/year.

Annual total sales volume of the three leading brands—Geniol, Mejoral and Cafeaspirina (the latter produced by Quimica Bayer SA)—runs over 100 million pesos; yet total direct (and indirect) sales promotion costs soak up one-fifth—20 million pesos annually.

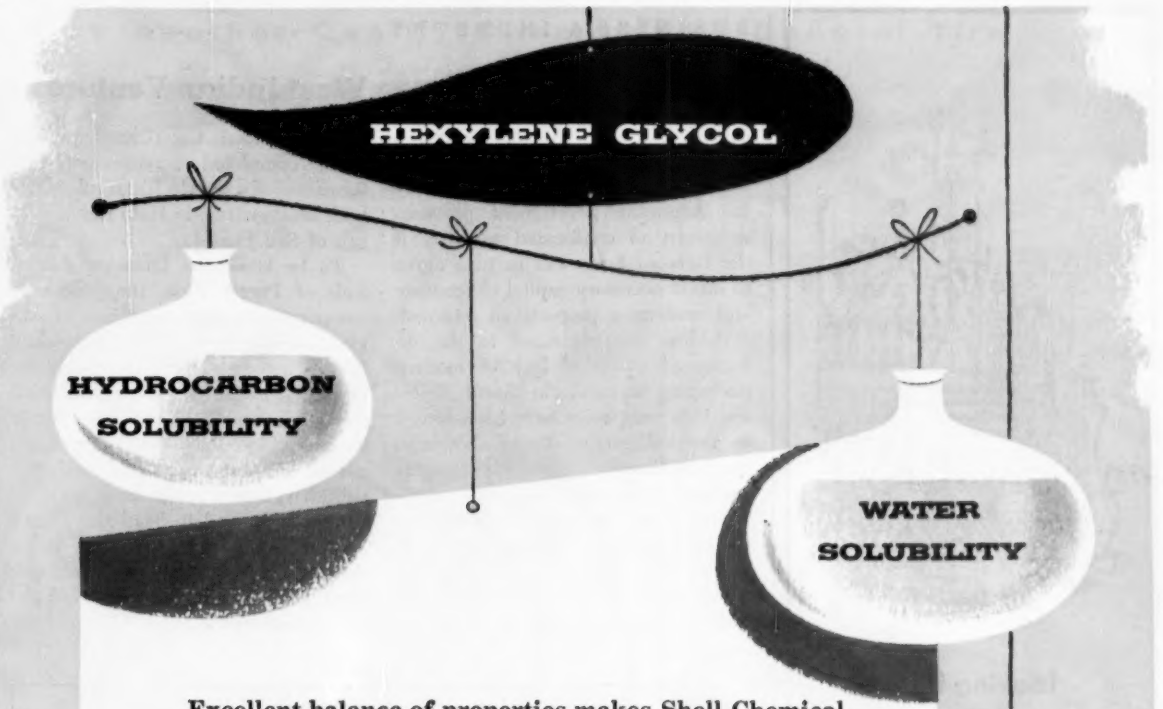
But what's worrying American producers more than the competition they face is the weight the government can throw behind any individual producer.

The government (in Argentina as well as in almost all other Latin-American countries) sets ceiling prices on pharmaceuticals; it can, by the flick of an edict, move that ceiling up or down, virtually wiping out a costly sales promotion program.

That means any company must concentrate on selling its product name—work on making that name a family byword.

Big Fight's Ahead: Making the future even more ominous: it now appears that most Latin-American countries are ready to turn back their seized war assets (including plants and trademarks) to the Germans.

In Argentina, for example, this will be a serious blow to Sidney Ross,



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Sterling Drug, Merck, Squibb, and a number of other firms. Since the end of World War II, Quimica Bayer has been effectively hobbled; now a settlement has been arranged whereby the Argentine government promises to return all confiscated property if the German firms will in turn agree to invest necessary capital to renovate and modernize property so returned.

Adding another facet to the dilemma: because of lack of modern packaging materials in South America, U.S. companies have been forced to use cellophane. Bayer, however, has continually kept Cafeaspirina packed in its traditional glass tube—though considered outdated, it still has the advantage of customer appeal.

How the battle will end, no one knows. But that the Germans will wage an aggressive fight is certain.

West Indian Venture

Diamond Alkali Co. (Cleveland) last week completed arrangements for formation of a Puerto Rican subsidiary with headquarters in Hato Rey, a suburb of San Juan.

To be known as Diamond Chemicals of Puerto Rico, Inc., the new company will start operations in August, plans to formulate an expanding line of detergents and cleaning compounds. First product scheduled for production: sodium hypochlorite bleach, which, like all other products, will be distributed and sold under the subsidiary's own brandname.

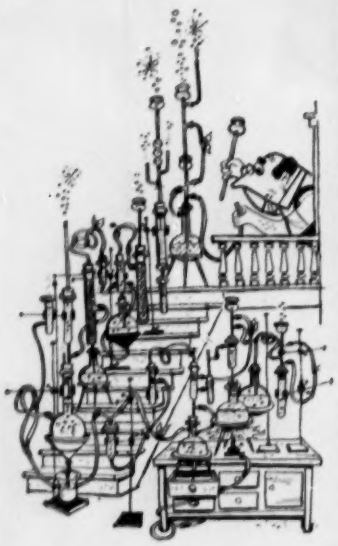
Officers named to head the Puerto Rican firm: S. S. Savage (also president of Diamond Alkali International, Inc.), board chairman; Miles H. Fairbank, president.

Splitting Up the Jackpot

TEXAS CITY CARBIDE pipefitter C. E. "Ed" Erwin shows how he feels (not how he'll act) when two years of accumulated savings are handed to him in one lump sum.

Part of an over-all company savings plan (available to employees since 1953), the Union Carbide program allows workers to authorize payroll deductions up to 7½% of normal straight-time average earnings—up to $83/month. Carbide then contributes 10, 20 or 30% of the employees' payments, depending on whether he has 1, 2, 3 or more years service credit.

Reaping the first two-year windfall in Texas City: a total of 2,266 men and women – with checks totaling $2,034,265.



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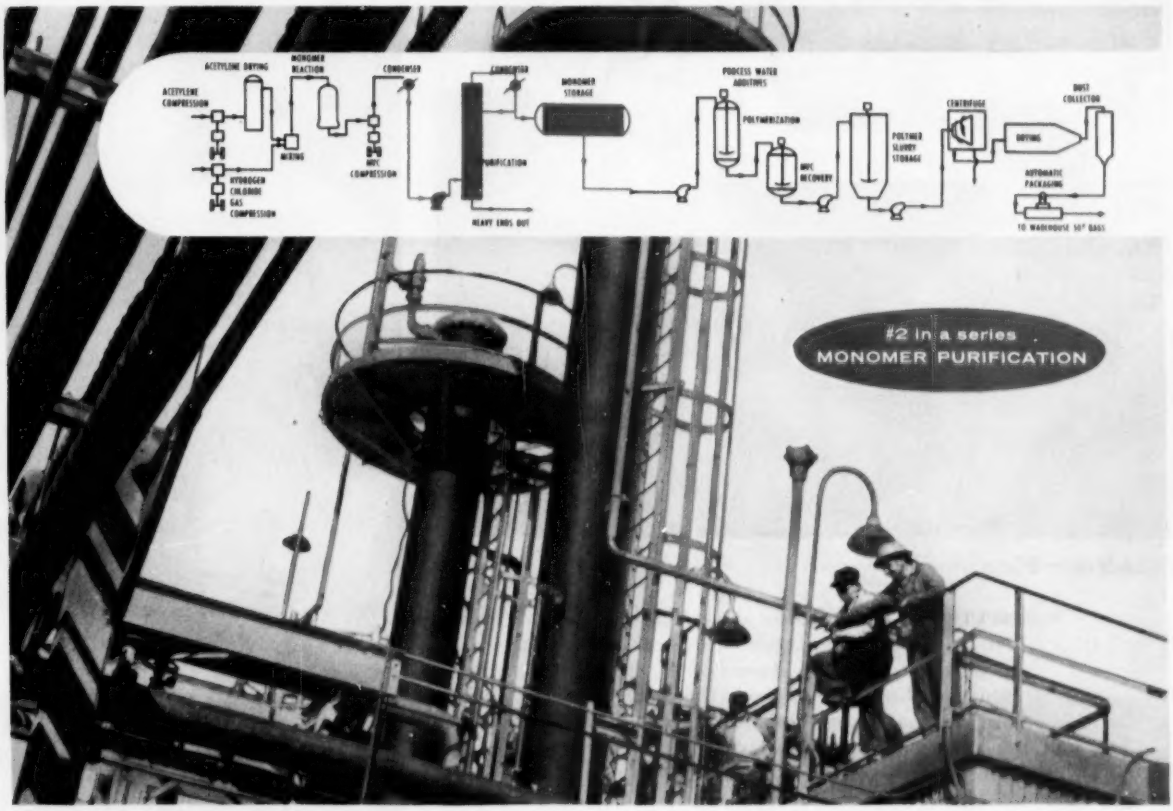

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First-Year Man

Third-Year Student

High-School Instructor

STUDENTS and teachers alike share in all plant activities. Here (above), Ronald Bruce (University of Oklahoma) is greeted by personnel supervisor M. E. Crowther; Engle Southard (University of New Mexico) operates a Herreschoff roaster; and George Robinson (Trona High School) takes hearth temperature data.

Three Goals in One

Initiated originally to take care of its high summer turnover rate at Trona, Calif., American Potash & Chemical Corp. has come to recognize the true merits of its healthy teacher-student employment program.

Manpower needs are materially aided; the company gains in public relations.

As is the case with so many chemical companies, American Potash & Chemical Corp. drifted, rather than steered, into its current student-teacher summer employment program. But that program today is to successful that company executives have only heartiest thanks for the luck that caused its inception.

Back in 1952, the problem that put summer placement in motion was Ampot's high turnover rate at its Trona plant site. To keep production lines running, it became necessary to fill spots vacated by regular operators (who took "French leave" during the hot months) with students culled—regardless of subject major—from colleges and universities throughout the West.

By 1954, however, high summer turnover had been virtually brought under control, thanks in large part to a switch in number of married vs single employees (from 30-70% to 70-30%) and through transfer of home ownership from the company to the employee (*CW, Dec. 4, '54, p. 38*).

Accordingly it was decided to limit summer employment to students of chemistry and chemical engineering.

Emphasis Switch: Reappraising the value of summer employment to the company, Ampot executives came up with three valuable assets of summer student employment:

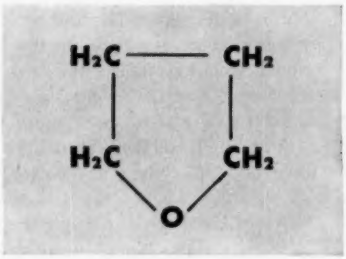
- American Potash gained an opportunity to look first-hand at junior and senior engineering students.
- Recruitment personnel were in on the ground floor with college officials and students alike.
- Professors and placement counselors had become acquainted with the type of manpower Trona needed; the idea that Ampot was strictly a mining company had disappeared.

Consequently a concerted effort was made to broaden the recruitment for summer jobs, cash in on this windfall of public relations.

How It Works: Today Trona recruiters make two trips a year (instead of one) to colleges and universities. On both jaunts they leave applica-

What's Your "Price I.Q." on These Furan Chemicals from Du Pont?

TETRAHYDROFURAN

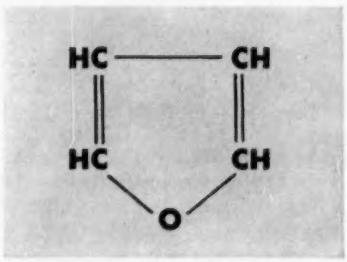


☐ 75c lb. TCL ☐ 35c lb. TCL ☐ 55c lb. TCL

You're right if you checked 35¢ lb.* as the price of this powerful solvent for polyvinyl chlorides. And this same low price warrants investigating tetrahydrofuran as a chemical intermediate, a use of increasing importance today. Tetrahydrofuran is finding increasing use in applying top coats of high molecular weight polyvinyl chlorides to polyvinyl chloride sheeting and supported fabric. THF and mixtures of THF and other solvents commonly used for polyvinyl chlorides can be recovered in standard carbon adsorption units with minor modifications to insure efficient recovery without formation of hazardous peroxides.

For 8-hour daily exposure, it is recommended that the concentrations of THF in air be held below 100 ppm. In this respect, toxicity of tetrahydrofuran is of the same order as that of many commonly used industrial solvents.

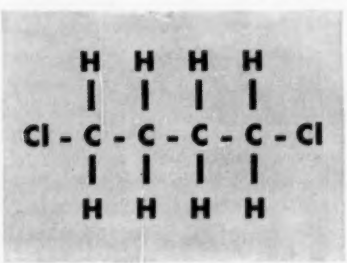
FURAN



☐ 20c lb. TCL ☐ 49c lb. TCL ☐ 33c lb. TCL

You get a perfect score on this part of the quiz if you chose 33¢ lb.* as the price of furan. The furan ring structure appears in many physiologically active, naturally occurring compounds. For this reason, the chief interest in furan has centered on its use as an intermediate in the production of pharmaceuticals and plant growth regulants.

1,4-DICHLOROBUTANE



☐ 32c lb. TCL ☐ 62c lb. TCL ☐ 78c lb. TCL

For the price of 1,4-dichlorobutane, 32¢ lb.* should have been your choice. The low price and availability of this alpha, omega dihalide in tank car quantities should now permit the commercial development of many syntheses formerly considered too expensive to be practical.

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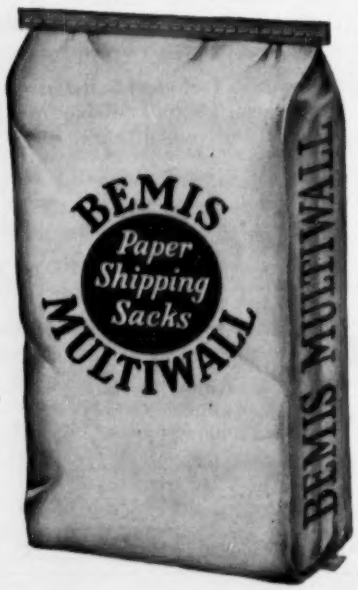

tions for summer jobs; by mid-May they're ready to make offers to qualified students who apply. Medical examinations are taken at school; dormitory accommodations are made available to all comers.

Blanket invitations are issued to professors and high-school science instructors. Reason: It's Ampot's feeling that a better understanding of industrial operations is needed in the high-school teaching ranks; the company (through teachers) gets an even broader sweep at potential employees.

Student Reaction: Students who have been to Trona are particularly enthusiastic about the company's policy of turning them loose in plant operations work. "I could have worked in a petrochemical plant closer to home, but I heard all they do there is mow lawns and read dials," says a second-summer worker. "Some of the fellows at college don't even know what a Dorr thickener looks like; me, I got in and cleaned one."

Teeth for FTC?

A bill that would immeasurably strengthen the hand of the Federal Trade Commission in acting against mergers that, it deems, violate anti-trust law has been introduced in the House of Representatives by Emanuel Celler (D., N.Y.).

The proposed legislation, if passed, would give FTC power to go to court for a temporary injunction against a planned merger—pending final commission decision on whether the merger is actually legal or not.

Moreover: the bill would also enable FTC to untie a merger already consummated—with measures needed to undo any ill effects it had caused.

Time the Drag: What happens now (because FTC often takes years to make a final decision on the legality of a particular merger): the assets of the combined companies become so intermeshed it is virtually impossible to separate them.

And further, damage to the competitive structure is already a thing of the past before the government can step in to take punitive action.

Examples of precisely this type of merger can be cited in the chemical industry, Celler maintains. The only remedy now is to require divestiture, and that's wholly inadequate to handle the situation.

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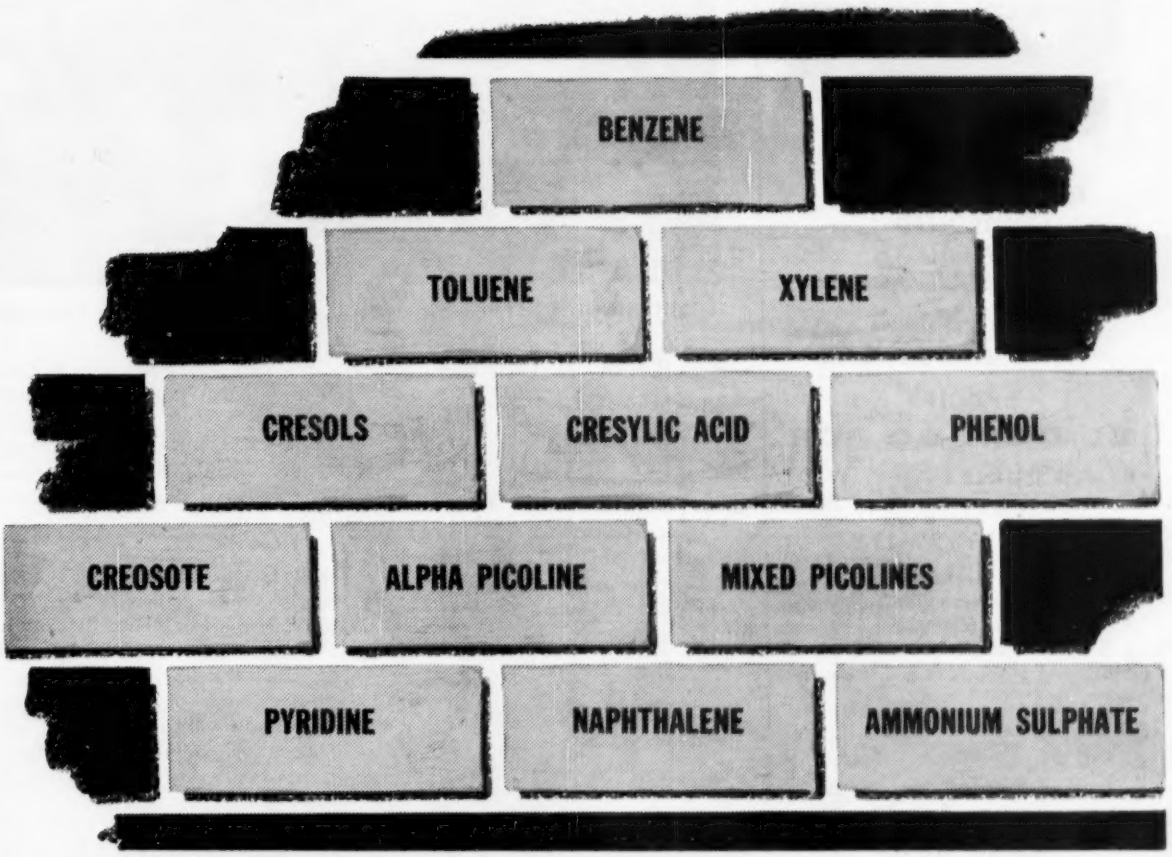

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A NEW COLOR MOTION PICTURE, "The Waiting Harvest," tells an interesting story of U.S. Steel's participation in the field of Chemicals. It is available on request in 16 or 35 mm film from Film Distribution Center, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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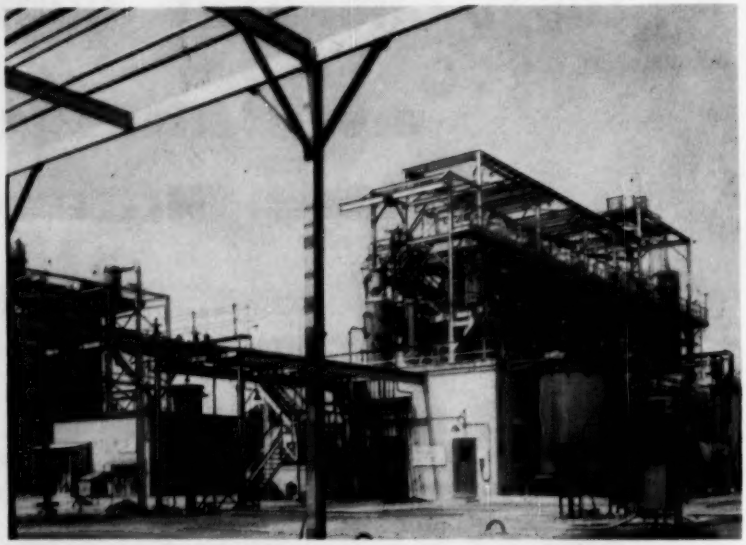

ISOPROPANOL UNITS: Expansion pattern at British Petroleum Chemicals.

FOREIGN . . . . . .

Petrochemicals/Great Britain: British Petroleum Chemicals, Ltd., which just commenced operations in 1951, will expand current facilities at a cost of over £8 million.

Main emphasis will be placed on plants to double output of olefins, and increase output of ethylene, propylene and butadiene. All units, company representatives say, will be in production by mid-1957.

•

Explosives/Peru: Explosivos S.A. has been formed in Peru with a capital of $1.6 million to manufacture industrial explosives. Interested in the new project: Poudreries Reunies de Belgique, S.A. (of Belgium), Dynamiten Aktien Gesellschaft (of West Germany), and various Peruvian mining companies—including Cerro de Pasco Corp.

Current imports of industrial explosives by Peru (largely from the U.S.) range around 11.4 million lbs./year; Explosivos S.A. will likely get a sizable cut of this business.

•

Dyestuffs/India: Amar Dye-Chem Ltd. will put its new dyestuffs plant at Kalyan (40 miles from Bombay) into operation in September. Partly owned (10% of the authorized $2.1-million capital) by Hilton-Davis (Cincinnati), the plant is designed to turn out 300 tons of naphthols, 300 tons of fast bases, and 100 tons of stabilized azoics and other intermediates for the Indian textile industry each year.

In 1953-54, India imported 1.9 million lbs. of naphthols and other bases, felt the heavy drain on its foreign exchange position.

•

Dutch/Israeli Trade: A new exchange and payments agreement has been signed between Israel and the Netherlands providing for trade with 22 million Dutch florins.

Under terms of the accord: the Netherlands will supply Israel with industrial oils and chemicals; Israel in turn will send fertilizers, glass, other products.

•

Petrochemicals/Japan: The Sumitomo Chemical Co. has decided to enter the petrochemical field in Japan, will build a plant to produce ethylene and ammonia.

Initial plans call for the importation of 5,000 tons of oil monthly for the proposed plant at Niihama City; operations will begin in March, 1957.

•

Antiobiotics/Mexico: Lederle Laboratories Division, American Cyanamid Co., is again expanding its Latin American production facilities. Ground has just been broken for a $1.5-million plant 12 miles south of Mexico City; the company plans to turn out a full range of products including Aureomycin, Achromycin, sulfa drugs, and folic acid.

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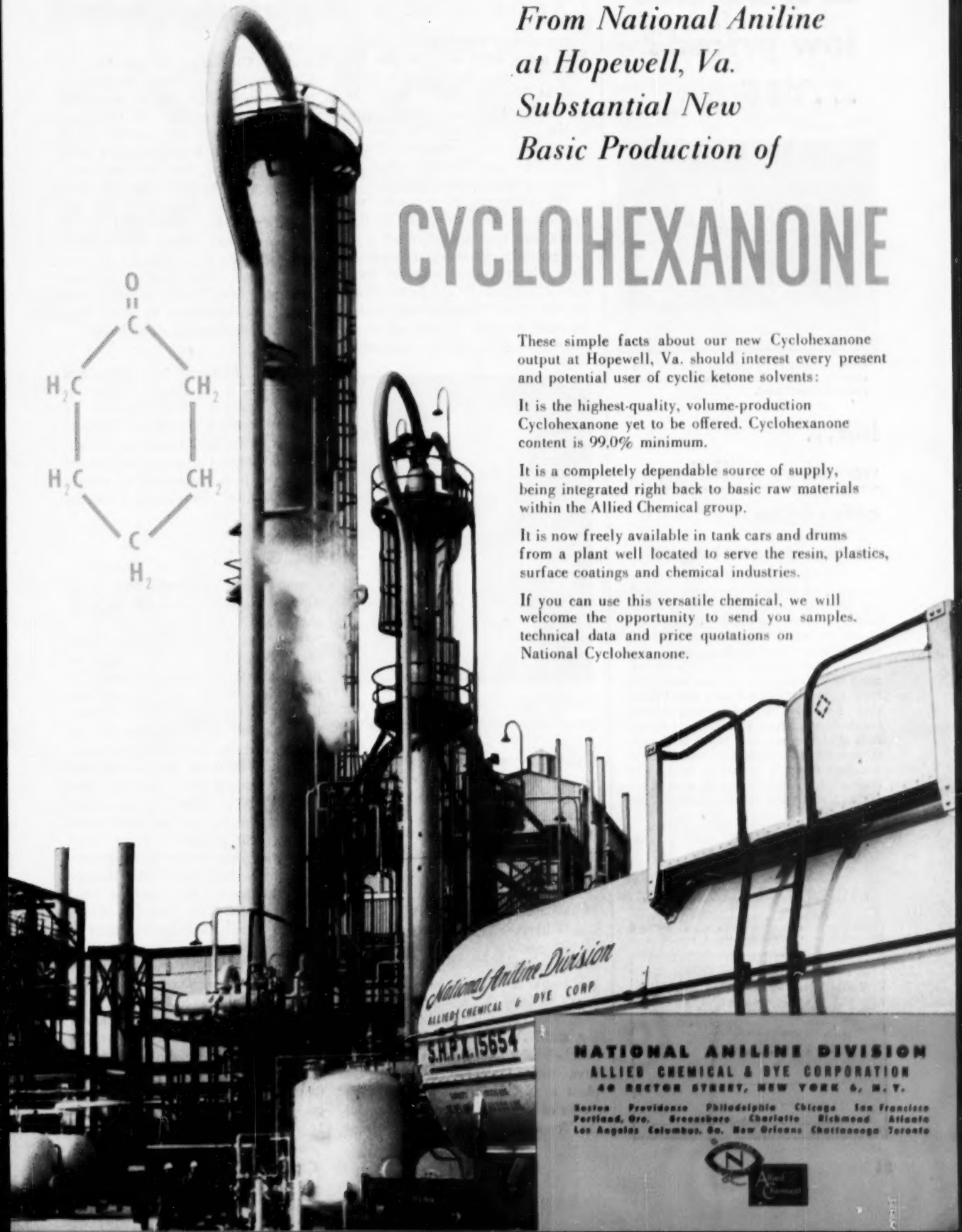

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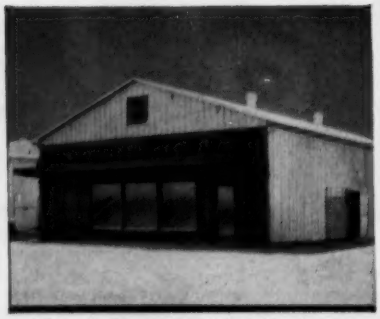

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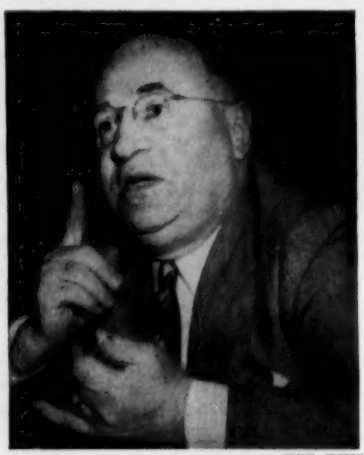
LABOR

Regional Rivalry: Industry that has been going south only for low labor costs now may be taking a second look at New England. Yankee mill towns that have lost their industries to the South are eager to have new employers, and unemployed New Englanders are figuring that low wages are better than none.

The labor unions generally were opposed to the closing of Northern plants, but now they're upset about the possible reopening of some of those plants under nonunion conditions. Emil Rieve's CIO Textile Workers, for example, are fuming about a reported proposal to reopen an 83-year-old textile mill in Connecticut



WIDE WORLD

CIO'S RIEVE: In North-South dispute, union assails 'undercutting.'

with "job-hungry workers" who would be paid $46 for a 44-hour work week, with no fringe benefits but possibly with a profit-sharing plan. This plan, says Rieve's union, would enable the operators to "undercut the South" at the workers' expense.

•

Pickets and Lawyers: The AFL Chemical Workers' Florida phosphate strike—which now embraces eight plants and 3,800 employees—is being waged in the courts as well as on the picket lines. At least three injunctions have been issued tending to limit the picketing, and ICWU Vice-President Walter Mitchell says the union will seek to have those orders vacated. Latest plant to be shut down: the Tampa works of U.S. Phosphoric Division of the Tennessee Corp., whose 700 employees voted to reject the company's 4.67¢/hour increase offer.

•

Seeking Guaranteed Wage: General CIO intentions regarding the guaranteed annual wage can be seen this week not only in the CIO Electrical Workers' current attempt to get a GAW clause in a new contract with General Electric, but also in a brief statement by the CIO United Rubber Workers noting that URW has negotiated its first (modified) GAW agreement—with Inland Rubber Mfg. Co. of Dayton, O., a division of General Motors. "The prompt achievement at Dayton," URW remarks, "will serve as an incentive to more than 325 other rubber and allied locals."

•

Canadian Strikes: At Shawinigan Falls, Que.—a stronghold of the Canadian Catholic Confederation of Labor—strikes branded as "illegal" have shut down Du Pont of Canada and Canadian Carborundum. Strikes also have been threatened at several other chemical plants in the industrial center.

LEGAL

Competitors' Complaints: Suits alleging unfair competition are in the news this week:

• At San Francisco, the U.S. Court of Appeals for the Ninth Circuit has upheld a district court's dismissal of the treble damage suit that had been brought by Dutch Paint Co. and Manning-Mitchell Paint Co against National Lead Co. Both district and circuit courts held that the plaintiffs had failed to prove their assertions that they had been injured by an alleged conspiracy in the sale and distribution of titanium pigments. These same companies were before that same circuit court a month earlier in a dispute over trademarks, and National Lead was successful *(CW, June 4, p. 40)*.

• In a suit filed last fortnight at Wilmington, Del., the Synvar Corp.—maker of industrial resins—charges that a subsidiary known as Synvar Southern Corp. was forced out of business by "underpricing" on the part of Reichhold Chemicals, Inc. Synvar says it set up that subsidiary to make and sell a Synvar-developed adhesive, and that it was making a "reasonable margin of profit" on that material at 13¢/lb. But Reichhold, according to

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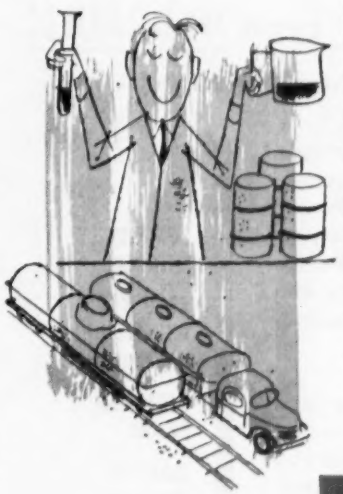

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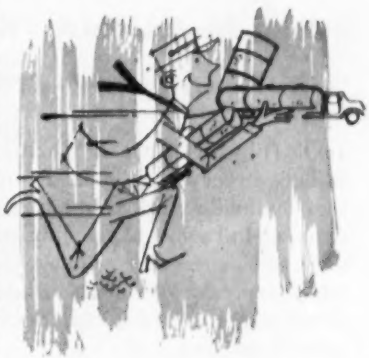

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Write for Bulletin KP54, HILLS-McCANNA CO., 2445 W. Nelson St., Chicago 18, Illinois.

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the complaint, broke into the business selling the same material at prices ranging from 7¾¢ to 11¢/lb.; and it cost Synvar $56,000 in 1951 and $128,000 in 1952 to meet those prices.

•

Process Patent Upheld: Also in federal district court at Wilmington, Chief Judge Paul Leahy upheld the van der Vliet-Stevens patent on a process of producing vitamin D_2. The court ruled in favor of Hartford National Bank & Trust Co. and Philips Laboratories, Inc., found that the patent had been infringed by E. F. Drew & Co., and that the plaintiffs are entitled to damages. Drew had attacked the validity of the patent on grounds of prior knowledge.

KEY CHANGES. . .

J. M. Cross, to vice-president, chemical operations, Verona Chemical Co. (Newark, N. J.).

Milton C. Mumford, to executive vice-president, Lever Brothers Co. (New York).

Eugene J. Harrington, to treasurer, and **Walker Penfield,** to secretary, Pennsylvania Salt Manufacturing Co. (Philadelphia).

Gerald S. Tomkins, to president, **Harry L. Dalton,** to board vice-chairman, **William H. Brown,** to vice-president, and **Albert H. Hammond,** to secretary, American Viscose Corp. (Philadelphia).

H. Percival Chase, to vice-president, C.M.C. Chemicals (California) Inc. (Los Angeles).

Frank P. Shonkwiler, to manager, basic sales, Harbison-Walker Refractories Co. (Pittsburgh, Pa.).

Elwood I. Lentz, to general manager, Western Phosphates, Inc. (Garfield, Utah).

David B. Hatcher, to vice-president, general manager, and director, and **William von Dielinger,** to vice-president, and director, Stepan Chemical Co. (Chicago).

KUDOS . . . . . .

To **Joseph G. Davidson,** vice-president, Union Carbide and Carbon Corp. (New York), the Chemical Industry Medal for 1955.

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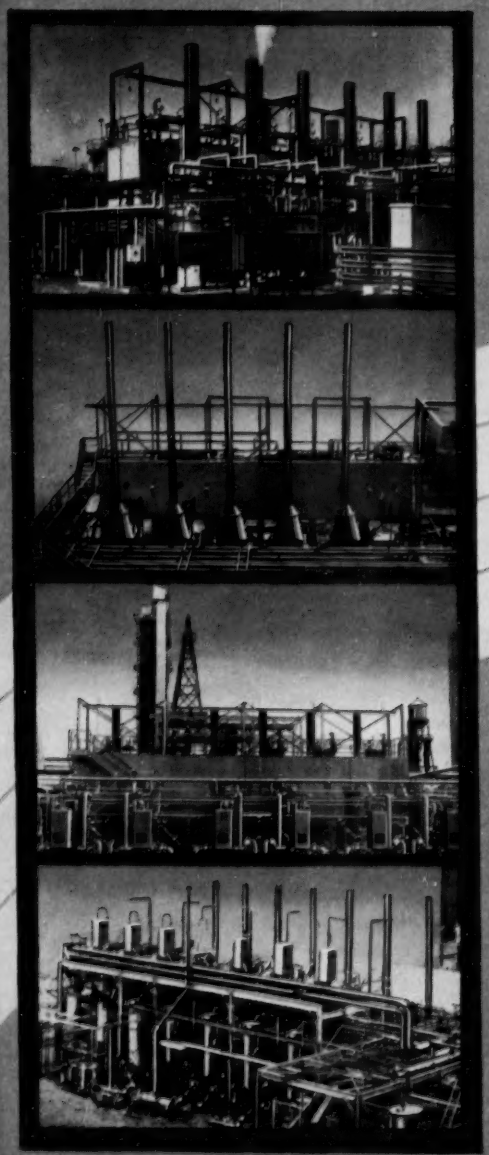

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FOSTER WHEELER

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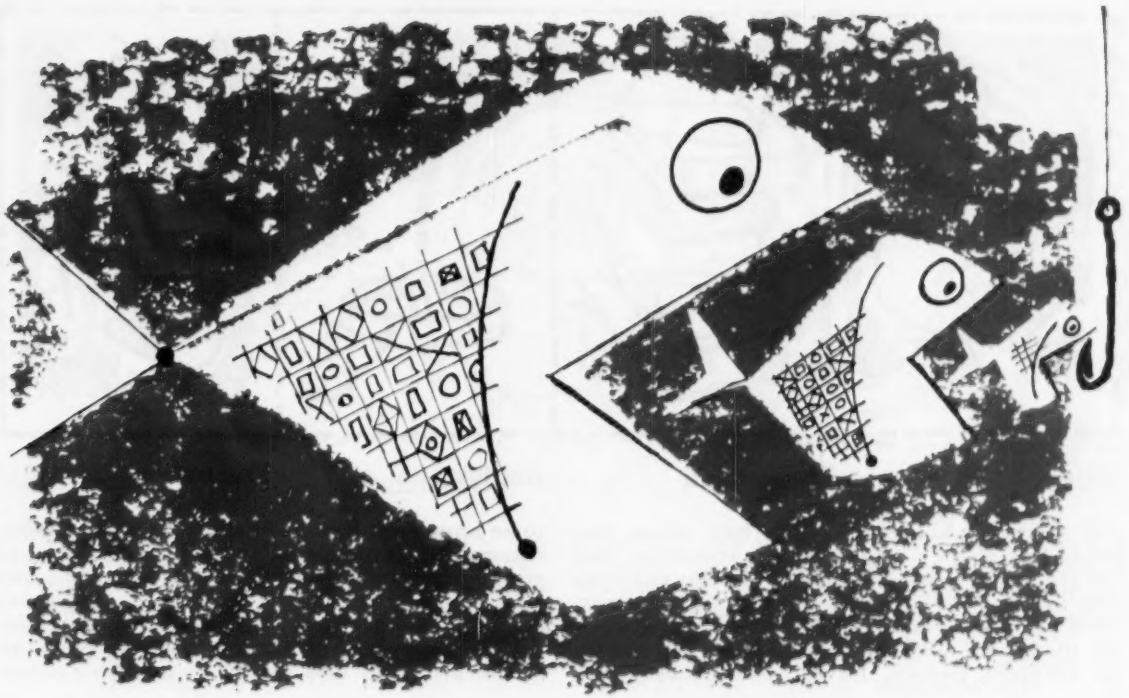
write for Bulletin O-54-1



Small ideas are bait for larger ones when a good "brainstorming' session gets rolling. It's one of the . . .

C W Report

New Creativity Gambits: How Management Can Fish for Dollar Ideas

A swell of excitement over methods of fostering creativity is now rolling over the chemical industry.

"Brainstorming" and kindred group techniques are getting their first tryouts in many research divisions.

Here's how the new tools of creativity are used, who fashioned them, who's using them, and what good they do.

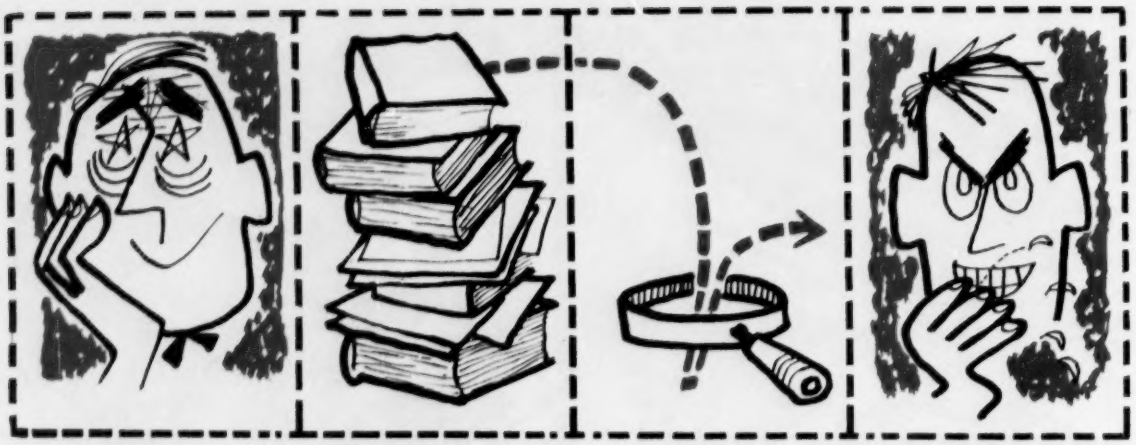
A growing circle of hard-headed industry people are currently paying more and more attention to a subject that not one of them can adequately define. But that's no cause for embarrassment; even the scholars, who have devoted a lifetime to the study of creativity, can't state with assurance just what they have been studying.

That's because creativity is largely an experience, rather than an entity. Its presence is signified by what is popularly known as the brainflash or the "aha" feeling of elation that comes with discovery, insight, illumination.

Definitions have been attempted. One corporation executive, a successful researcher of long standing, put it this way, not long ago:

"One type of research problem can be solved by obtaining complete data so that only one conclusion is possible . . . In another type of problem, the possibilities are almost infinite, and it is hardly possible by mere industry to . . . find a solution. Then a flash of genius . . . or a leap of the imagination is required."

The latter is the problem that de-



Urge Preparation Analysis Frustration

NO ONE REALLY KNOWS how ideas are born. But there's widespread agreement that the train of events culminating in the exhilirating "brainflash" comprises these seven steps. They do not necessarily follow neatly one upon the other and they may be defined differently by different people. Nevertheless, they teach some important lessons to students of creativity. Among the foremost of these is that plenty of good hard mental labor is essential to the process's smooth working. The urge — becoming aware of the problem and wanting to solve it; preparation—gathering information relevant to the problem; and analysis—breaking down

mands a creative mind — and the people who possess this precious attribute are not as rare as is commonly thought. As a matter of fact, it's probably true that everyone is creative in some degree. That, at any rate, is the premise of the inspired band of proselyters who are carrying the new gospel of creativity to industry, education and the general public.

In books, magazine articles* and speeches, they offer this message: everyone can become more creative by working at it. For management, the implication is clear: industrial personnel of all classifications can be made more effective in solving problems, selling products or developing new products and processes.

How? By getting them to accept and apply practices that may, to the average person, seem pointless and possibly scatterbrained. Nevertheless, aver the disciples of the methods in question, they work, and that's all that matters.

Evidence of their message's appeal to research management is the popularity of creativity as a topic for speeches† and conferences. Today, wherever research leaders gather, creativity appears to be the chief item on the agenda.

But this very popularity serves to point up the anomalous nature of progress in the field: basic creativity research is lagging the technology of creativity; psychologists have yet to determine why some practical creativity-spurring methods are effective.

These academic investigators are looking into such things as the relationship between creativity and intelligence, morale, professional status, rewards, school grades. In addition, they are studying the elements of thinking ability, problem solving, indeed, the very nature of imagination itself.

As of now, their findings in any of these areas are far from conclusive. The practical students of creativity, on the other hand, find themselves in a less complicated position; all have essentially the same concept (*see illustrations above*) of the idea-forming process. But, what is more important, they have tools for manufacturing ideas at a rapid rate.

Not all of the ideas so fashioned are useful or even reasonable; only a small proportion of "hits," however, are needed to justify all the "misses."

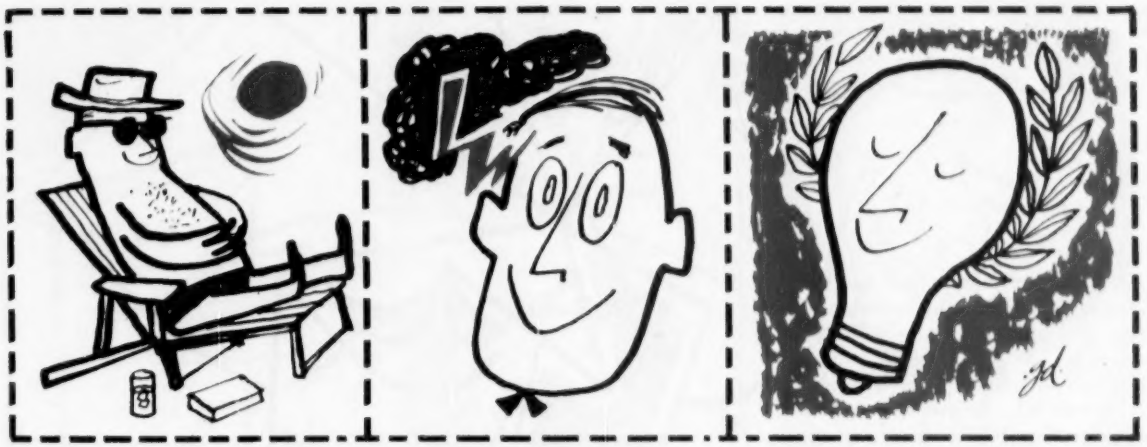
Overpowering the Muse

The foremost technique of idea-synthesis now in use is the "brainstorming" session, a kind of mental free-for-all that is the adopted child of the man considered by many to be the spiritual leader of the new cult of creativity. He is Alex Osborn, an unlikely combination of educator and adman, who introduced brainstorming to the staffers of Batten, Barton, Durstine & Osborn 16 years ago when he was actively heading the big agency.

Today, in his middle 60s, Osborn is far more educator than advertising executive. His latest book, "Applied Imagination," is used as a text for courses in colleges (University of Buffalo, Massachusetts Institute of Technology, Boston University, Indiana University), companies (General Mo-

*Recent articles on the subject have appeared in such national magazines as *Life* and *Better Homes and Gardens*. *The Harvard Business Review* carries an article in the current issue titled, "Stimulate Your Executives to Think Creatively"; and related stories have appeared in numerous business and professional society publications in recent months. Among general circulation publications, *The Reader's Digest* has treated the subject extensively.

† One of the most recently presented: the talk given last month by Sugar Research Foundation President Henry Haas, on accepting the American Institute of Chemists' Honor Scroll Award. His subject: "Stimulating creative Minds."



Incubation Illumination Verification

this information, trying to use it to solve the problem—are names for this skullwork. Equally important is the realization that frustration is a normal and vital part of the process—and that subsequent relaxation, allowing the problem to incubate in the unconscious mind, is the only way illumination (or the "aha" feeling of discovery) can be brought on. This knowledge is behind the way many companies are encouraging researchers to let up and turn away from a tough problem when the point of frustration has been reached. In one firm, frustrated researchers are encouraged to go home and have a shower, or a change of mental activity.

tors, International Business Machines, B. F. Goodrich) and the armed forces (Air Force ROTC).

For the past several years he has been engaged in an intensive, personally financed campaign to get colleges and universities to institute creativity courses. To further this goal, Osborn has started a Creative Education Foundation that is governed by a board made up of himself, Lee Bristol, Jr., of Bristol-Myers; Seymour Knox, an official of the University of Buffalo; and Welles Moot, a regent of New York state.

Thanks largely to these efforts, a host of colleges and universities are instituting (or have recently instituted) special creative-thinking courses. Pioneers in this field are New York University, University of Buffalo and the University of Nebraska, all of which have offered such training for several years.

Although Osborn's crusade appears to be winning converts, his ideas are by no means universally accepted. A number of college professors and business executives (especially technical people) have railed at what they call his "*Reader's Digest**" approach."

Crux of Osborn's creed is "uninhibited thinking"—a concept that is the pole star of all navigators in the uncharted waters of creativity. The goal is the release of the imagination from the restraints of judiciousness. The theory is that the desire to be judicious nips many a valuable idea in the bud, because the idea seems foolish or elementary on first sight.

To temporarily emancipate his imagination from judicial restraints, a person brainstorms—that is, he gets together with a group of similarly intentioned colleagues and lets his ideas—wise or otherwise—pour forth. A good brainstorming session resembles a high-spirited progressive-school class more than it does a conventional business meeting.

But what may look like chaos to the unpracticed eye is a carefully conceived process—under astute supervision and with a definite objective in view.

Brainstorming sessions usually comprise groups of from five to 12 individuals, last about an hour. One member serves as chairman and provision is made to record what is said.

The chairman starts the session by stating the problem as succinctly as possible; it's then up to the group to generate ideas according to these four rules:

- Criticism of anyone's idea is absolutely forbidden during the session.
- The wilder the idea, the better.
- The more ideas, the better.
- Participants should strive to combine or enhance ideas expressed during the session.

Ideas generated are usually evaluated the following day by the same brainstormers, although others may also be called upon for evaluation. Brainflashes surviving this critical appraisal are then channeled to appropriate management people for investigation and action.

Fundamentally, brainstorming underlies all group ideation methods in use by industry. The most significant practical innovations on the basic technique have been made by William J. Gordon of Arthur D. Little, Inc.

Gordon's responsibility is research and his idea-conception principles were the moving force behind the establishment in 1951 of the company's novel design synthesis group. Comprising six members** and a group leader (Gordon), the group attempts to combine the best creative features of the individual inventor and the organized research team.

Gordon deliberately attempts to

* Which published Osborn's first writings on creativity.

** Production specialist, mechanical engineer designer, artist-industrial designer, chemical engineer-sculptor; model maker, and a liaison agent to aid the last-named in the practical translation of theoretical concepts.

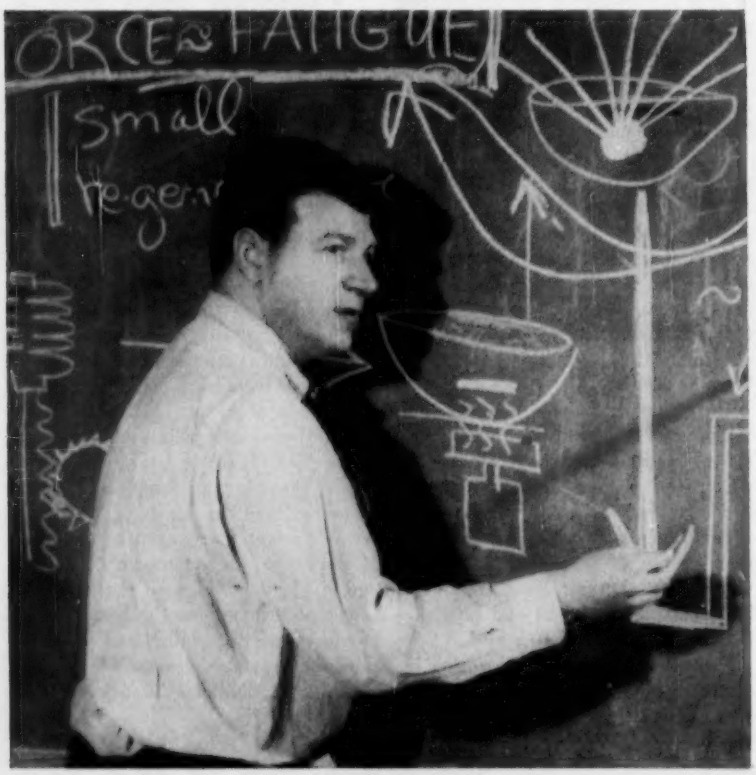
C W Report

BRAINSTORMING: The goal is uninhibited thinking; the barriers are . . .

delay the expression of personal solutions to a problem being brainstormed. His premise: the individual who comes up with a brainflash tends to become convinced of the superiority of his own idea; he may then be more concerned with defending his own brainchild than trying to come up with better ones.

To delay the onset of pay-dirt ideation, Gordon does not reveal the nature of the problem at the outset of the group session. Rather, he may put forth the general area in which the problem lies. The problem of developing a new dye, for example, might first be discussed from the broad viewpoint of color or coloring.

Because the specific problem is not revealed, the group leader is faced with a demanding role. He must start the discussion with a topic that is relevant and likely to prove rewarding of ideas. As the discussion progresses, he must adroitly channel idea-production toward the desired end; this is done by interjecting conditions that serve to define the problem.



GORDON: In no hurry for answers.

Finally, the leader must determine the right time to disclose the exact problem. This is not as simple as it sounds. According to a study conducted by the Harvard Graduate School of Business Administration: ". . . by the time the problem is revealed . . . a high level of excitement runs through the group. People all talk at once and fight for chalk and space at the blackboard.

"From this point on, the principle behind the problem solution is crystallized and the group starts to develop the new idea in some detail." Unlike conventional brainstorming, sessions of the Gordon method require upwards of three hours.

Brainstorming on a mass scale is offered by a technique known as Method 66. Briefly, this innovation calls for the division of large groups into several smaller ones that brainstorm a problem individually. Each subgroup contributes its one best idea.

Experience with groups of various kinds has taught these lessons:

- The most productive panels are diversified in background. In research this might call for a group made up of chemists, physicists, engineers, several of whom work in different areas of the company's business.
- Specific problems make for best results. How to develop a given new product is a far better topic than potential fields for new-product research.
- Problems should lend themselves

. . . conformity

. . . worship of reason

. . . fear.

to a creative approach; determining the conditions for optimum yield of a chemical reaction—a problem having just one answer—would not be a good choice.

• Participants should all be of roughly the same rank. This is in line with the effort to provide a permissive atmosphere. Fear of appearing foolish in the eyes of a superior will cause anyone to think twice before unleashing a particularly wild brainchild.

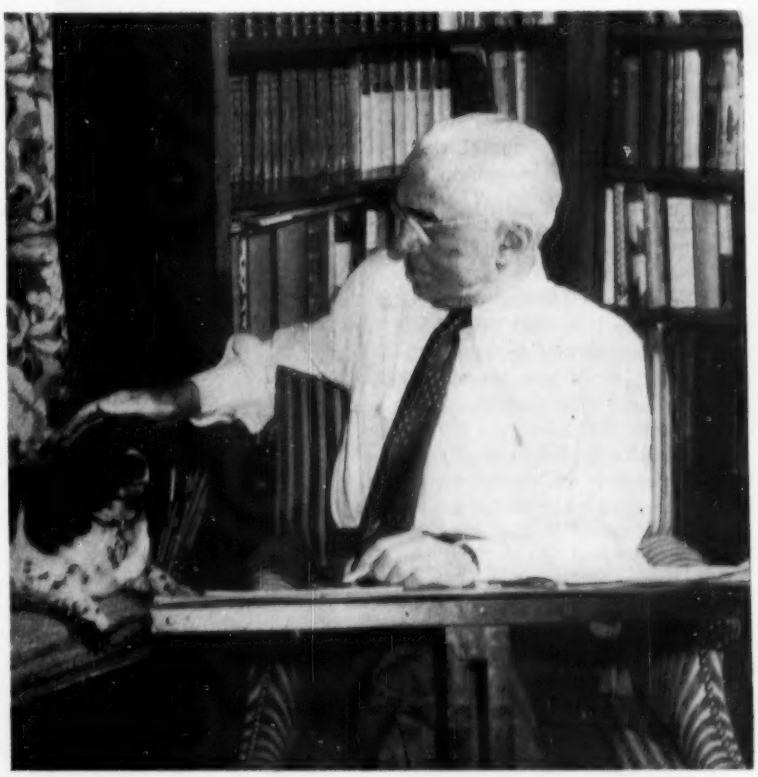
Among other factors that tend to dampen individual spontaneity are a very strong tendency to conform; worship of reason and logic; overemphasis on competition or cooperation; intense desire for security (no gambling instinct) and distrust of coworkers. What Professor John Arnold of MIT terms perceptual blocks—faulty observation, difficulty in isolating problem, failure to distinguish between cause and effect—also must be reckoned with.

Arnold, whose attempt to force his engineering students to think creatively was recently recorded in *Life*, has conducted short creative seminars for researchers of The Texas Co., Bell Telephone Laboratories, RCA and others.

Who Does It

Industry, in general and the chemical industry, in particular, is taking to creativity-promoting techniques with enthusiasm. Today only a relative handful of companies have organized programs (most of these are in research), but that's due largely to the newness of the methods involved. A *CW* survey of firms detects the beginnings of activity in the overwhelming majority of larger chemical process companies.

General Electric, of course, stands out for the duration and intensity of its efforts. Since 1937, GE has offered year-and-a-half "creative engineering" courses to engineers and chemists who show creative ability during their first year with the company. Recently, GE launched "creative approach"



OSBORN: In no awe of judiciousness.

C W Report

seminars in its plants. Both programs draw heavily on the precepts of brainstorming.

B. F. Goodrich's creativity program, launched last year with a pilot group of 20 technical men, suffered a severe setback recently with the death of company training director Elroy Stromberg in an airplane crash. The Goodrich project is reportedly at a temporary standstill.

Monsanto, Du Pont, Union Carbide, U.S. Rubber, Dow are using group sessions and other new creativity-sparking techniques in research. Dow supplements its efforts in this field by publishing a monthly "creativity review," which reports creativity studies by psychological workers.

Dow, perhaps, does as much in the field as any chemical company. A number of its research groups have continuous programs that provide special training and practice in the techniques of creativity.

Prominent in this respect is the so-called "idea squad" in the company's Texas division. This program involves monthly evening meetings of six to eight individuals who brainstorm new subjects of importance. Thorough notes of these sessions are taken and circulated to various groups as a spur to original thinking.

Dow's Western division, moreover, conducts several six-week (two hours a week) courses that apply creativity-fostering techniques to definite problems. Each course has four or five participants.

In addition to this type of class work, researchers are made aware of new information in the field of creativity by such means as the "creativity review" mentioned above. The personnel department's staff psychologist circulates this review of creativity research and writings. Dow also supports academic studies in this field.

Others, notably American Cyanamid and Allied Chemical, admit to a great deal of interest in brainstorming and related approaches in research, but do not appear to be taking action.

A number of firms, not included above, are concentrating their creativity-sparking attentions in sales (*CW, June 11, p. 74*). A leader here is Ethyl Corp., although many pharmaceutical houses reportedly are utilizing Method 66 meetings for distribution purposes.

Many companies that are not yet in the creativity swim have adopted a wait-and-see attitude that the creativity-boosters ascribe to a kind of distrust. They believe that people who pride themselves in their judiciousness tend to scoff at the value of "uninhibited thinking," "brainstorming" or whatever else it may be called.

This attitude is neatly expressed in a letter Osborn received from a businessman who entered a creative thinking class. "As I sat through the first part of the first session," writes the erstwhile student, "I thought the subject, the instructor and the author all crazy." Subsequently his opinions are said to have changed radically.

Although the group techniques are creating the most stir, a number of other factors enter into the chemical industry's efforts with creativity. Indeed, in a score of other ways, nearly all chemical firms are today doing something to boost the creativity of their researchers.

Most of these efforts are aimed at providing a favorable environment.

Carbide research management, for example, makes a point of encouraging men to let up and relax when they have hit the point of frustration on a problem. Carbide's associate research directors are alert to notice when it's time for a man to let up on a tough problem. Possessing no administrative responsibilities, they can devote their time to this kind of function. General Electric also tries to get men to let up when they reach frustration.

Extra winter vacations, encouraging hobbies and attendance at professional meetings are other increasingly popular ways management is seeking to provide researchers with the relaxation that is an essential part of the process of creating.

General Mills, among others, allows its researchers a certain proportion of working time for personal projects that are not approved by management for regular attention.

Phillips Petroleum is one firm that encourages the development of patentable ideas by making supplementary payments to an inventor for evidences filed at the Patent Office.

Moot Point

How effective is the increasing effort being invested in creativity? No one can say for sure. The brainstormers are most expansive about the value of their system; some deny ever having had a session that did not produce a commercially rewarding idea.

General Electric, whose program has been running long enough to yield

'Brainstorming' Pfc.

PFC. WALTER MANSFIELD of the Chemical Corps' Materiel Command Headquarters (Baltimore, Md.) is the man behind the new creativity-consciousness at Fort Belvoir's Engineers Research and Development Laboratories. A former instructor in General Electric's creative engineering program, Mansfield recently demonstrated "brainstorming" to the laboratory's staff. Four sample sessions were conducted. Although they were intended only to show soldier-engineers how to brainstorm, they resulted in many good leads for project engineers.

Harshaw

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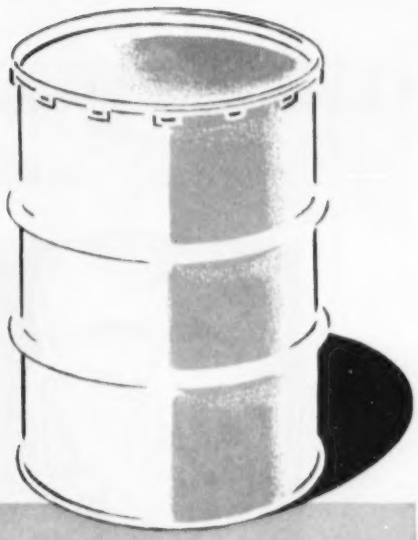

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Sodium Formate 0.3	

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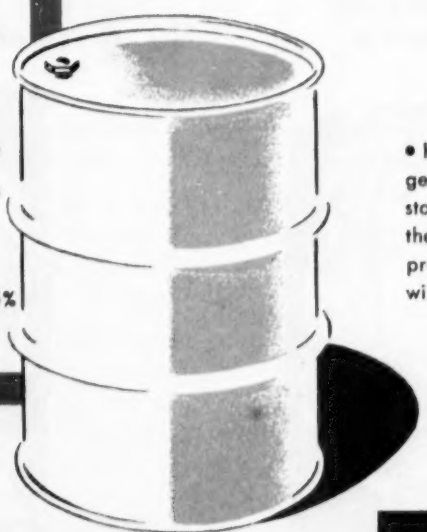
SPEC 102

Packaged in Steel Drums 425 pounds net

25% solution of sodium methylate in methanol

Analysis:

Sodium Methylate Content 24.5 to 25.5%



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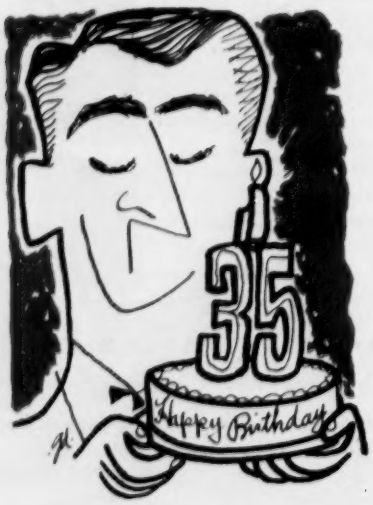
HARSHAW

Fact or Fancy? Some Popular Beliefs About Creativity

1 It drops sharply after 35.

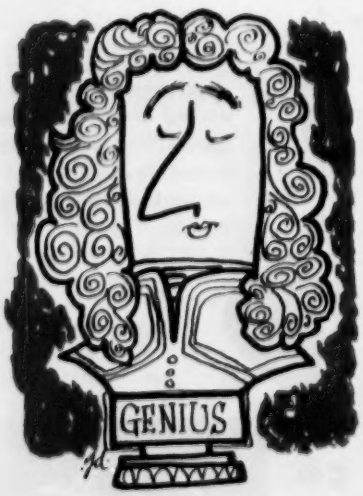


Not true. Studies indicate that man's creative powers do reach a peak in the 30-34 age period. But the decline is much slower than the rise. It appears that a man is likely to be as creative at age 60 as he was in his twenties.

2 Being neurotic helps it.

No one knows for sure. But the best current theory holds that neurosis is a detriment to creativity. Reason: the neurotic has so many repressions that free play of the imagination is severely limited, and inventiveness stunted.

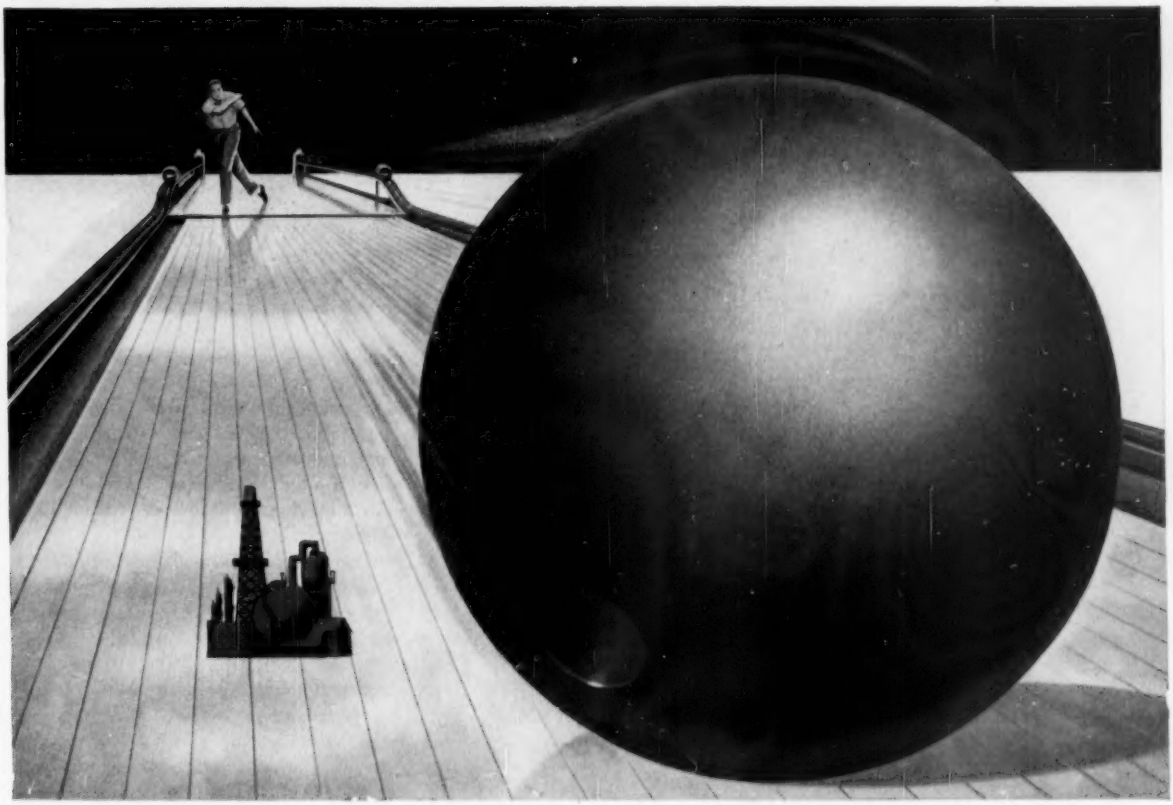
3 Only geniuses have it.



False. The sciences are full of those who have demonstrated ability to produce something new by a leap of the imagination. Geniuses, like Einstein and Newton, could go on intuitive binges, but most people have some creative capacity.

4 Formal education hinders it.

A debated point. Each school should be considered separately. Yet there's strong feeling that mass education stifles imagination, teaches "one way to do things." Teachers, observes a psychologist, lack time to encourage the "oddball."



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USC'S GUILFORD: 'The scientist is not such a social animal . . .'

The Reason Seekers

It's apparent that there is no good measure of the effectiveness of the creativity-spurring gambits. About the only thing that can be said with assurance is that they work. Finding out why, and learning how the human creative process functions is the chosen work of a growing number of psychologists.

An acknowledged leader of this group is University of Southern California psychologist J. Paul Guilford, former president of the American Psychological Assn. With his USC associates, he has been conducting fundamental research (under a grant from the Office of Naval Research) on the detection and measurement of "thinking abilities."

Psychologist Guilford offers this disarmingly simple definition of creativity: "a pattern of abilities that enables a person to produce ideas that are rather original." Thus far, in his work with college students and service personnel, he has isolated some 16 factors that fall under the general heading of creativity. Among them: sensitivity to problems; fluency of ideas; ability to have novel ideas.

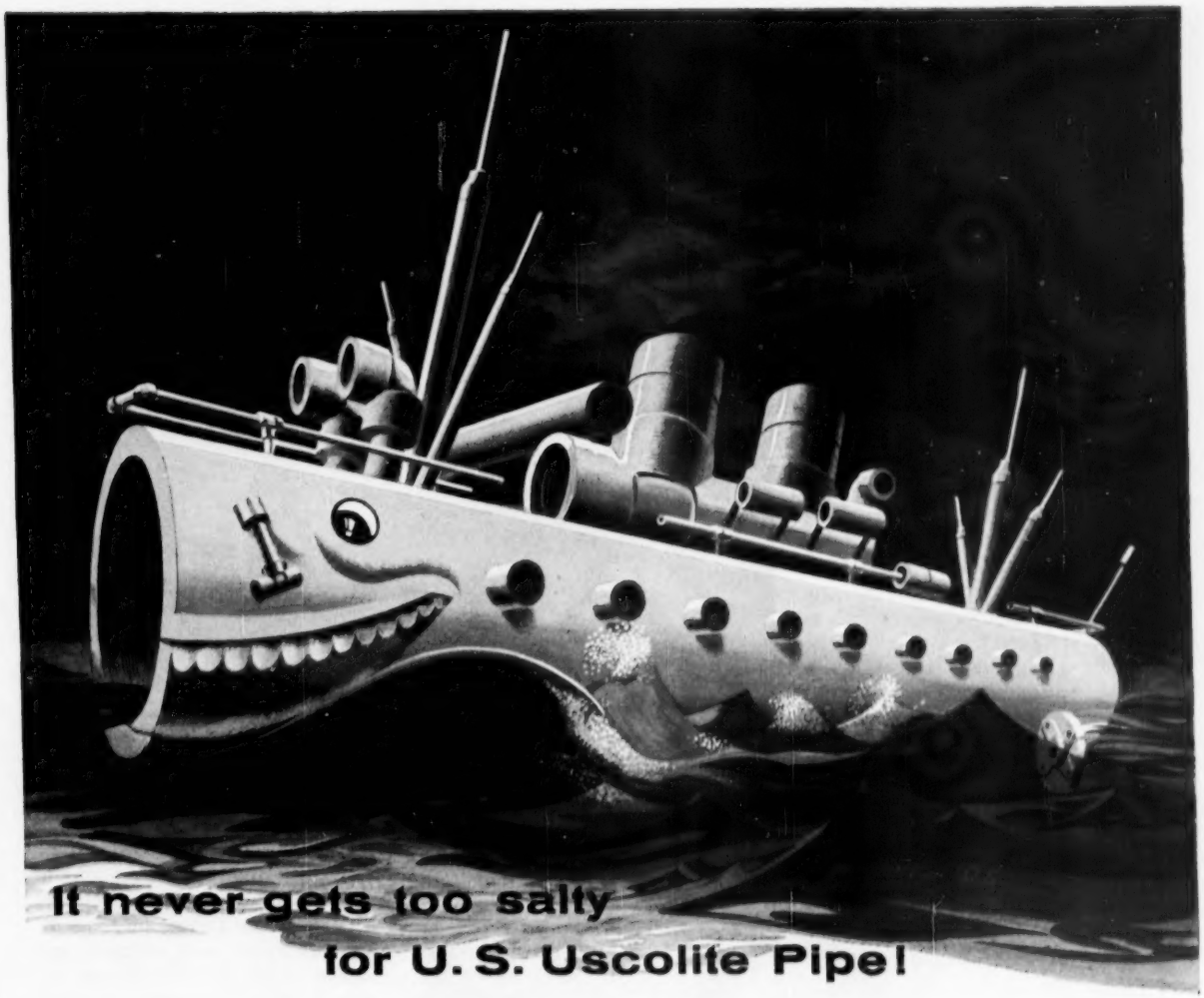
The principal thing industry can do, he believes, is to create a permissive atmosphere, look with more tolerance on unorthodoxy. This may be a lot easier said than done since, in Guilford's opinion, "too many bosses

C W Report

data, reports that individuals who have had the creative-engineering course average more than double the number of patents of those who have not had the same training. Moreover, reports GE, 75% of all program graduates "occupy positions in management or in the forefront of their technical field"; only 25% have no direct management responsibilities. Program graduates, incidentally, subsequently get jobs at the same level as nongraduates. Last, the company discloses that veterans of its creativity programs have garnered far more than their proportional share of company awards for outstanding individual contribution.

Others who have had experience with brainstorming and other creativity techniques are sure that the methods in question work. But none can say with assurance how well they work.

'Too many bosses are sensitive about their own abilities . . .'



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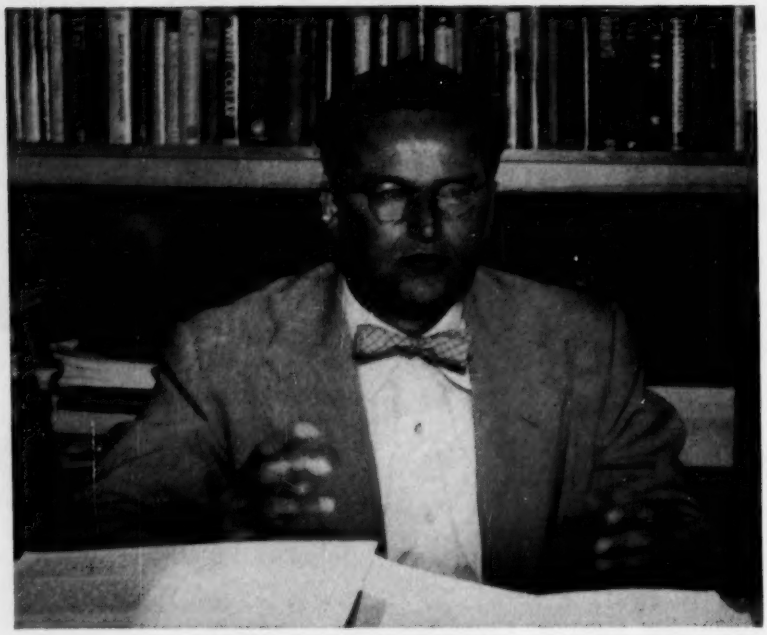


CHICAGO'S STEIN: He's seeking answers for industry.

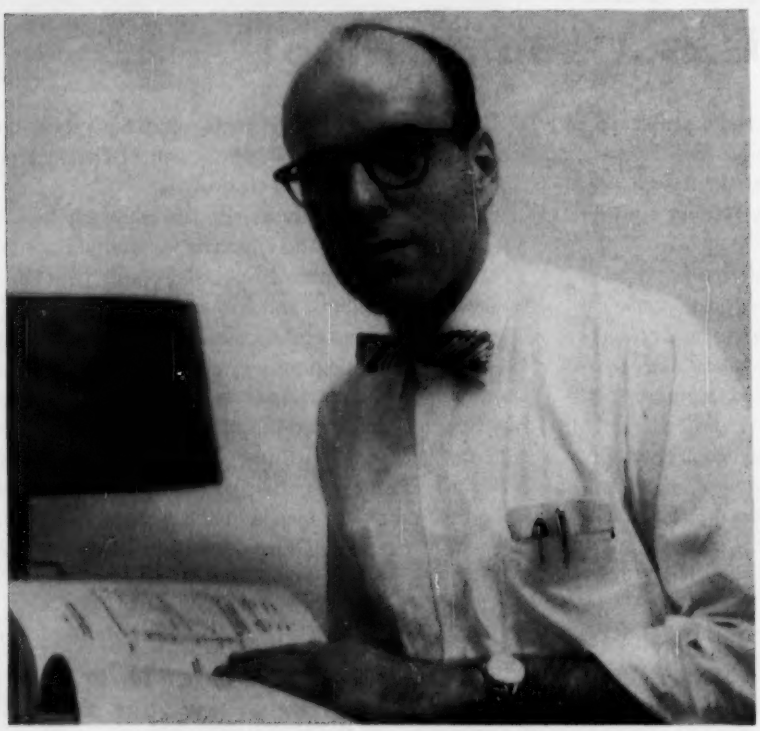
are sensitive about their own ability to produce, fearful of their subordinates' ideas."

Specifically, he feels that industry can stimulate creativity by rewarding it. Also that management men become familiar with the factors that make for a creative individual, so that these factors may be consciously encouraged or, at least, not repressed.

Guilford thinks that training courses and group techniques such as brainstorming can be of value. But he wonders about their usefulness in science, where almost all great discoveries have been made by individuals rather than groups. "The scientist," observes Guilford, "is not such a social animal as the advertising man."

Another prominent reason-seeker is psychologist Morris Stein, associate professor at the University of Chicago, who has been studying (with support from Industrial Research Institute) the nature of the research process.

Because his work is far from finished, Stein is unwilling to talk about results. But it seems certain that his findings will have the most immediate value for industry. Basically, these findings will strive to tell: how administration of research affects creativity; what personality factors are most directly concerned with research and creativity in the physical sciences.



MICHIGAN'S PELZ: He finds the need to belong.

Donald Pelz, University of Michigan psychologist, also is not concerned with creativity exclusively; he measures scientific performance and accomplishment. Although Pelz' work has several years to run, some findings have been made. Sample: scientists who have a strong sense of belonging to their research groups tend to perform better.

When the studies of Guilford, Stein, Pelz and numerous colleagues are all finished, creativity will be far less a mystery; abetted by the new science's practitioners, industry will be in a better position to upgrade its most valuable resource.

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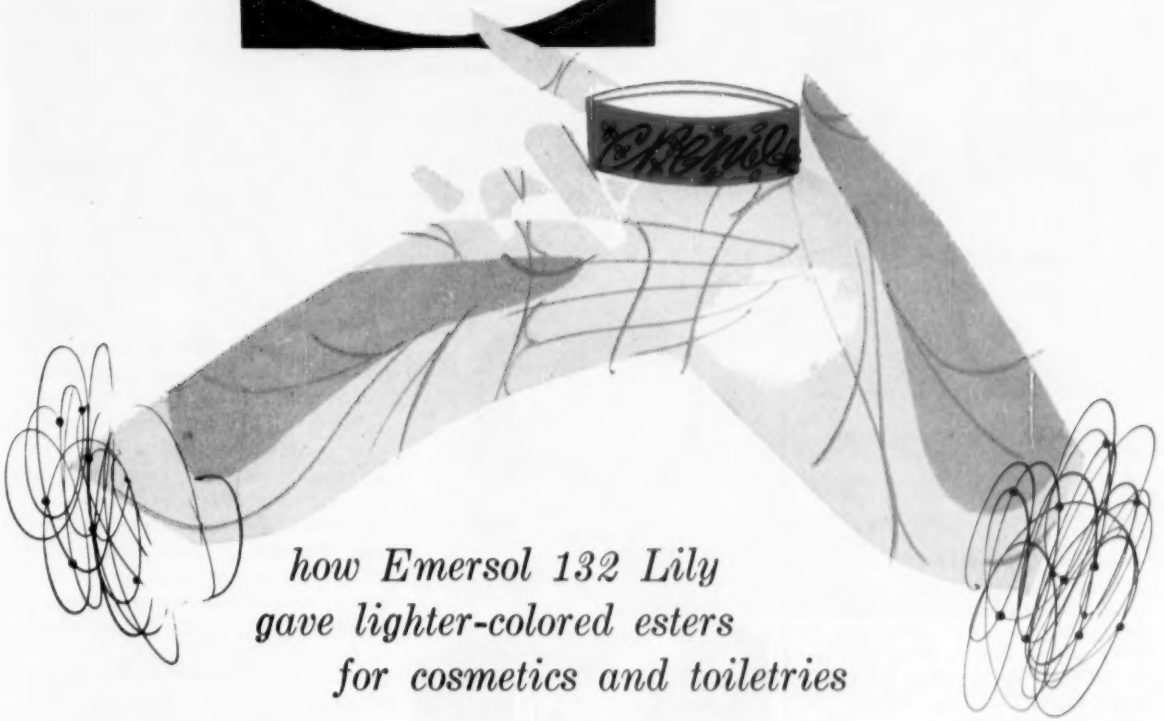

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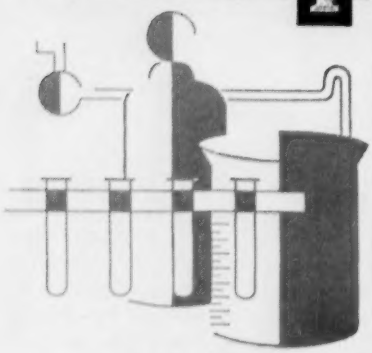

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RESEARCH . . . .

Radiation Countermove

All the excitement over such new polymerization techniques as low-pressure polyethylene processes hasn't hindered research in radiation catalysis. Indeed, this week, an array of new radiation-produced polymers proves that radiation catalysis may soon be a force to be reckoned with by plastics makers.

The eye-catching polymers (and copolymers) were prepared during the past year by Naval Research Laboratory's (Washington, D.C.) Thomas Callinan. They reportedly feature high purity and unusual physical properties. From such starting materials as ethylene, acrylonitrile, vinyl acetate, etc.,* Callinan fashioned high-density, high-melting products by gamma-ray irradiation. Yields are said to be substantially quantitative.

NRL'S CALLINAN: In unique polymers, a case for radiation.

Radiation's answer to the new crystalline polyethylenes is reputed to be a slightly denser, slightly higher-melting product, with no residual catalyst to cause color or odor problems. Correspondingly, Callinan's other polymers offer advantages over their conventionally made counterparts.

Whether or not these advantages will be enough to stimulate a market depends largely on cost and the results of application studies still to be made. But for certain military uses (chiefly electrical) the tyro polymers seem assured of a future. One problem they have already solved is the corrosion of plastic-imbedded electrical components (e.g., transistor leads) by residual catalyst—such as benzoyl peroxide in the case of polyesters.

The catalyst-free radiation polymers can't cause such corrosion, also show slightly improved dielectric strength because of their purity.

In dielectric studies carried out jointly with Johns Hopkins University (Baltimore), Callinan found that regular polyethylene showed slight but measurable electrical losses with increasing temperature. Under the same conditions, the radiation-made polymer retained its insulating ability intact. Oxygen, absorbed by the regular polyethylene during manufacture, is believed to cause the dielectric loss.

As insulators, however, the new polymers owe more to their higher melting points than to their purity. Because insulating efficiency generally decreases as the melting point of a plastic is approached, the new polyesters reach their electrical limits at a 30 C higher temperature than do their regular counterparts.

And greater thermal stability means longer life since plastic failure increases rapidly with comparatively small temperature rises.

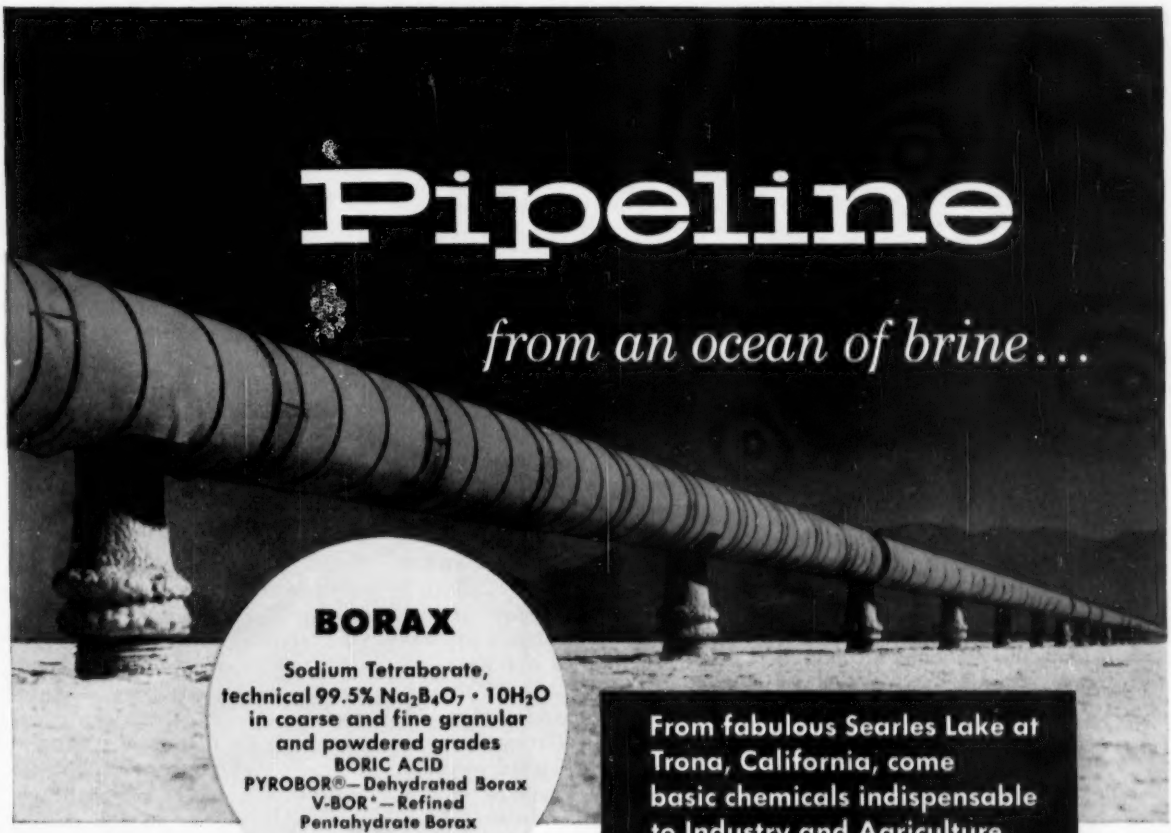
A likely use for these premium properties exists in nuclear power plants—for which the Atomic Energy Commission currently has five proposals by five private groups.

But the newcomers needn't be limited to electrical applications. Their high densities also mean high tensile strengths—an important consideration in most plastic uses.

To develop applications will be the chore of potential users. Callinan's studies have been largely fundamental and promise to continue in this vein.

For one thing, he is interested in the role temperature plays in radia-

* Some others: acrylic acid, vinyl ethers (e.g., butyl and methyl), methyl methacrylate, methyl acrylate, silicones, and polyester precursors (i.e., glycols and dibasic acids).



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tion polymerization. Polyesters, for example, polymerize nearly half again as quickly (25 minutes vs 40 minutes) at 60 C as at room temperature. The resultant products are 20-30% denser than benzoyl peroxide-catalyzed polyesters prepared at 40 C.

Callinan has also found that the optimum conditions for silicone polymerization by rays are use of a high-molecular-weight (40,000), high-viscosity (around 200,000 centistokes) silicone oil, and about seven hours of irradiation. Silicone rubber made this way is clear and stronger (1,800-psi. tensile strength) than the chemically polymerized form (800 psi.)

One remaining stumbling block to commercial radiation-polymerization is the high cost of the cobalt-60 radiation source (used by Callinan in his experiments). Because of this, conventionally made plastics are likely to be much lower in cost for a long time to come.

Undaunted by the now-unfavorable cost picture, other researchers are likewise probing radiation polymers. Among them: A. Charlesby of Britain's atomic energy research establishment (Harwell), who is also favoring cobalt-60 as an energy source for polymerizations. Charlesby's earlier work was done with high-energy radiation from an atomic pile that gave low yields, left polymers radioactive.

At the Atomic Energy Commission's Brookhaven National Laboratory (Upton, N.Y.), researchers are investigating the polymerization of solid materials such as acrylamide, frozen acrylic acid, and salts of acrylic acid. This work, being done in conjunction with Brooklyn Polytechnic Institute, is of interest because radiation is the only known way to polymerize solid materials. No practical use for the phenomenon has yet been found.

Another Brookhaven project is the preparation of graft polymers by irradiation. Successful grafts of methyl methacrylate on styrene, and acrylonitrile on polyethylene have been achieved this way. Prominent in this field are France's A. Chapiro and M. Magat (of the Laboratoire de Chimie Physique in Paris) who hold one of the few radiation graft-polymer patents. They are looking into a variety of systems including Kel-F and acrylonitrile.

At Brookhaven, meanwhile, there's continuing interest in irradiating polyethylene film. One recent Brookhaven find is that irradiation makes regular polyethylene more receptive to printing inks, probably because the surface becomes altered under impact of the gamma rays.

Similarly, General Electric's Central Research Laboratory (Schenectady) is not letting up its effort to find new uses for irradiated polyethylene (*CW, April 3, '54, p. 69*).

All in all, the wide interest shown by chemical firms in radiation-induced reactions (*CW, Jan. 29, p. 48*) seems to be yielding results. If the cost barrier can be overcome, the radiation advocates may be in business sooner than many anticipate.

●

Patent Parcel: An even score of patents released this week by the Atomic Energy Commission brings to 767 the total number of AEC patents and applications now available for licensing. The newcomers, like their predecessors, are available from the AEC on a nonexclusive, royalty-free basis.

Among the latest entries: a method of reducing impure or technical-grade vanadium pentoxide to yield ductile, massive vanadium metal (2,700,606); an apparatus for coating powdered base materials with radioactive materials (2,702,523); a process of recovering uranium from aqueous solutions (2,703,271); and a method of converting fluorine into hydrogen fluoride by superheated steam (2,706,676).

Interested applicants are asked to contact the Patent Branch, Office of the General Counsel, at the AEC.

●

Fertile Field: To support research in soil minerals and their effect on phosphorus fixation, the University of Kentucky (Lexington) has been newly awarded a two-year $11,500 grant by the National Science Foundation's physical sciences division (Washington, D.C.). The research is expected to lead to more efficient lime and fertilizer application through increased knowledge of the effect of calcium and magnesium on phosphorus fixation.

●

Research Montage: Chemical projects under way at Oklahoma A&M's research foundation (Stillwater) comprise $200,000 in contracts, are topped by an AEC award of $80,951 for studies of uranium ore purification and separation of radioisotopes from the atomic pile. Also on the program:

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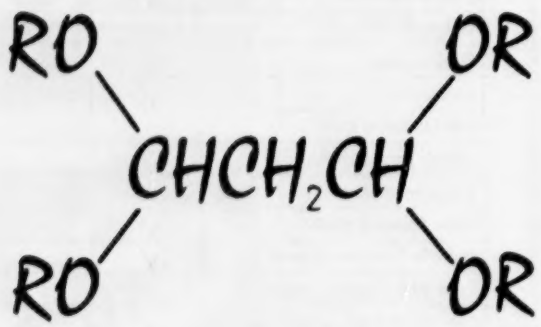
(TETRA-ALKOXY PROPANE)



suggestions cross-linking agent; insolubilizing agent, substituted pyrimidine building block; usual dialdehyde reactions; pyrazole intermediate

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quest (for the National Institutes of Health) of a quick means to determine fluoride in water; an Air Force study of polymers and copolymers of olefin sulfides; and research in new uses for sperm oil—a $14,500 assignment sponsored by Cincinnati Milling Machine Co.

•

Innovation Search: Individuals with new ideas on rocket motor design and fuels are being sought out by Lt. Col. M. W. Beardsley, assistant for innovations, RDTE Headquarters, ARDC, Box 1395, Baltimore 3, Md. The Air Force's object: to get fresh views on some old vistas (*CW, March 26, p. 48*).

•

Atomic Fair: Sixty-five U.S. firms as well as U.S. and foreign governmental agencies will exhibit the latest in peacetime nuclear developments at the first Atomic Industry Trade Fair, to be held Sept. 26-30 in Washington, D.C. Sponsored by the Atomic Industrial Forum, Inc. (New York), the exhibit will include displays of research reactors, reactor components, isotopes sources and applications, consultant services, design engineering, package power, control systems, construction and fabrication techniques, shielding materials and handling devices.

•

Vertical Move: Coincident with expanding its research activities, Lakeside Laboratories, Inc. (Milwaukee, Wis.) is increasing its synthesis facilities. New facilities include high-pressure hydrogenation equipment and high-vacuum stills to be used in both drug development and manufacturing.

•

Acid Study: A $4,650 grant to Wofford College (Spartanburg, S.C.) by the Research Corp. (New York) will support a project to synthesize and ascertain the ionization constants of substituted phenanthrene-9-carboxylic acids. The research is intended to develop information on a suspected factor in skin-cancer formation.

•

Color Check: Research under way at the National Bureau of Standards (in cooperation with the Porcelain Enamel Institute) is aimed at finding better ways to check the color of manufactured items against a standard. The investigation includes evaluation of various types of colorimeters.

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Within the area served by Consumers Power Company are Michigan State University and sixteen senior colleges.* Construction of the first building for a Flint branch of the University of Michigan is under way. Close by, in Ann Arbor, is the University of Michigan itself, and, in Detroit, Wayne University and University of Detroit. Combined enrollment of Michigan's 40-odd colleges, universities and technical institutions is about 100,000 students.

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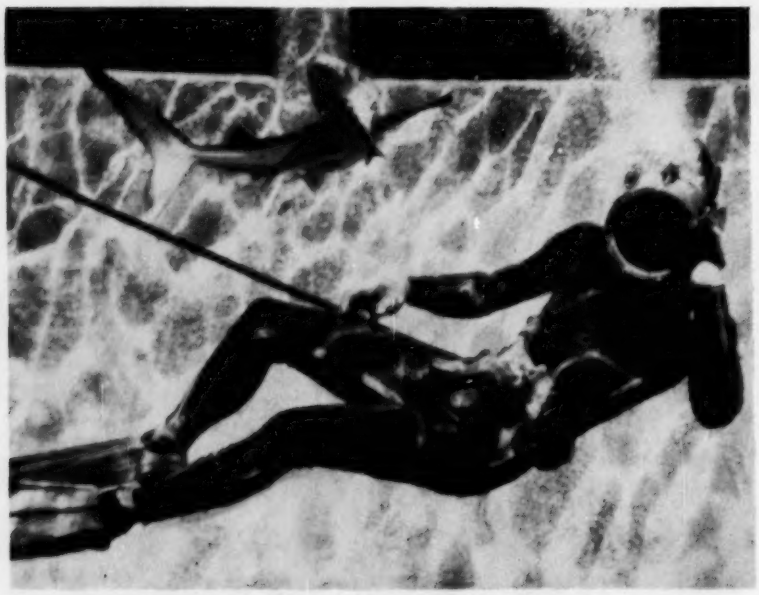

MAN-EATING SHARK: For skin-divers, a cake to dampen sharks' appetites.

Chemical Scarecrows Boom

Deer, rodents, dogs, sharks, and pigeons can be kept in line with new chemical repellents—a fast-growing specialty field. Problem: to hurt neither the property nor the animal.

Toward the end of August skin divers, fishermen, and channel swimmers will be one up on a traditional enemy: the man-eating shark. In about five weeks American Cyanamid's long-time-coming shark repellent will be commercially available.*

A cake of copper acetate, wax binder, and Cyanamid's Nigrosene water-soluble dye, the repellent is dangled in the water, releases, like an octopus, a blinding murk. More important, it kills the shark's appetite. A recent test, when Roy Sutter swam the Catalina Channel, showed that sharks backed off, and the swimmer wasn't harmed—even when he got some of the repellent in his mouth.

Long required equipment on overseas military flights, the repellent will be marketed to the public as Sharko by Shark Chaser Chemicals Co. (San Pedro, Calif.). Although in the long run its biggest users will probably be commercial fishermen (up to three-quarters of a catch—and expensive nets—are often lost to sharks), immediate plans call for sale of personal cakes at $10 for 6-8 hours of continuous protection.

Sharko is simply the latest development in animal repellents—a field of chemical specialties that has been growing since just before the war.** Animals are all right in their place, but it's something of a job to keep them there. Although, as with sharks, it is sometimes simply a matter of expediency to use a repellent instead of something more deadly, more often it's a matter of humane treatment. The problem is to protect things (crops, homes, gardens, people) from the creatures without harming either them or the things protected.

Dog Gone: The big consumer market is for dog and cat repellents, odors of which—most often lemongrass oil, a common perfume for cheap shampoos—usually drive off the pets. According to legend, this effect was discovered in India where villages in which lemongrass grew remained unmolested by wild animals.

Typical is Dog-Check (also good for cats, as are most dog repellents), made by Nott Manufacturing Co. (Mount Vernon, N.Y.). It is 13% lemongrass oil and 87% denatured alcohol. Also essentially lemongrass oil mixtures are Sudbury Laboratories' (South Sudbury, Mass.) Chaperone line of pet specialties (including Mistake—a rug cleaner), a series of repellents sold for cats, dogs and rabbits.† Both Dog-Check and Chaperone sell at 8 oz. for $1.

Pet repellents generally come in two forms: a liquid to spray outdoors around gardens, shrubs and trees (but not on foliage, which the usual alcohol solvent might burn); a powder to sprinkle indoors on furniture. Generally, the liquid form contains 10-15% active ingredient; the powder form, 2-3%.

Roped Off: Two firms have pet repellents in aerosols. Boyle Midway Inc. (New York) has Ridz, and Bohlender Chemicals, Inc. (Tippecanoe City, O.) has Dogsoff, which also comes in a liquid form (which sells better than their aerosol). House of Huston, Inc. (Coral Gables, Fla.) has a dog, cat and insect repellent, which is body-applied and includes a deodorant. Gilbert Research Labs (Morristown, N.J.) has a repellent rope (100 ft. for $1.50) saturated with minerals, creosote and petroleum distillates, which has a strong odor that repels dogs, cats, rabbits (and sometimes people, according to one dealer). National Dog Wick, Pacific Coast Scent Co. (Compton, Calif.) is designed to be hung where animals shouldn't go. Scram, made by California Spray Chemicals Co. (Richmond, Calif.), is a bone-oil formulation.

Crop Savers: The mischief done by dogs and cats, however, is most often a nuisance rather than real trouble. More serious is damage caused by government-protected wild life. The Wildlife Research Laboratory (Den-

* Cautiously waiting developments, the company has been, till now, so publicity-shy about the product that it passed up a public relations man's dream—when Florence Chadwick wanted to use some while swimming the Catalina Channel.

** Chemical control of animals involves both pushing and pulling. For example, the control of slugs, destructive to gardens and aesthetically obnoxious, is effected with an attractant—Commercial Solvents' Metaldehyde. It attracts slugs and kills them (Metaldehyde's toxic action is usually augmented with an added toxicant).

† One of its uses: a circus bought some to treat its animal trainers' clothing.

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ver) of the Fish & Wildlife Service (U.S. Dept. of the Interior) has conducted extensive research since 1941 to determine how to save crops without hurting animals.

Since deer eat crops (a favorite food of deer: young fruit trees), the repellents are made to taste bad rather than smell bad. And because they must cover a lot of area, the repellents must last longer than two or three weeks (about par for dog and cat repellents).

Wildlife tried hundreds of repellents, found two that controlled deer the best: Goodrite z.i.p. (B. F. Goodrich Chemical Co., Cleveland) and Diamond "L" Brand (Harry N. Leckenby Co., Seattle). Goodrite z.i.p. is a formulation of z.a.c. (zinc dimethyl dithiocarbamate-cyclohexylamine complex)† and a rubberlike adhesive, polyethylene polysulfide, is marketed only by Larvacide, Inc. (New York).

Sprayed on at 1 lb./4 gal. water, it is effective against deer, rabbits, mice, rats, porcupine and a number of others. Animals leave treated vegetation alone after tasting it—as long as other food is available. If it comes to a question of starving, however, the deer will swallow his pride, the food, and the repellent.

The z.i.p. doesn't hurt the animals, but the Food & Drug Administration hasn't yet cleared it for food crops. Goodrich expects this to keep sales slow for at least another year.

Diamond "L" contains nicotine sulfate and is relatively inexpensive—1 gal. ($8) mixes with 200 gal. water. It keeps deer away, is colorless and odorless.

Rabbits on the Run: Tests just completed indicate that Ringwood Repellent (Edwal Laboratories, Inc., Ringwood, Ill.) is quite effective against rabbits and other rodents. The active ingredient is trinitrobenzene-aniline complex. Sprayed on, it reduced rabbit damage to seedlings 75%, Wildlife told *CW*, but it has some phytotoxic characteristics. It is particularly harmful to conifer (Douglas fir, pine) trees during wet weather when the adhesive doesn't dry quickly.

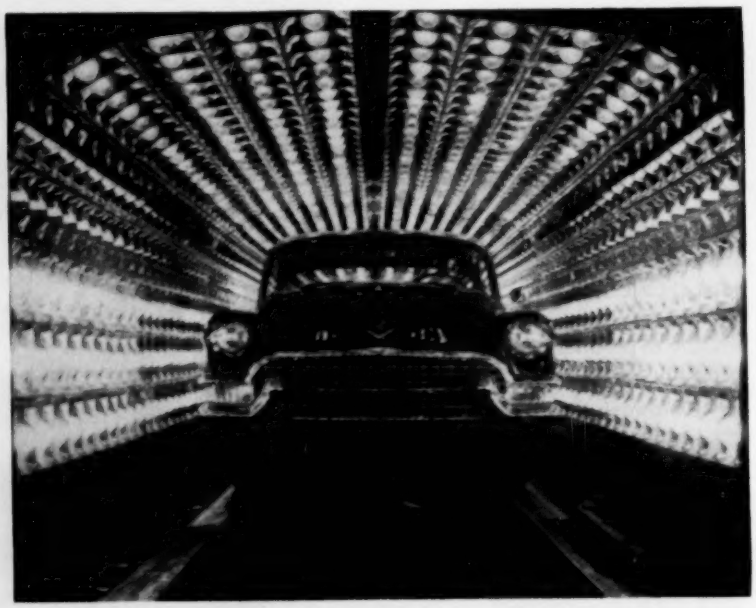
Quite promising is the possibility of using it or z.a.c. to protect food packages, textiles, electrical wiring and other such materials in transit or storage against rats.

† Also, claims Goodrich, an effective fungicide, insect repellent, and rot-resistance agent.

For the Birds: Roost-No-More, a product of National Bird Control Laboratories (Chicago), is designed to keep pigeons off public buildings. A combination of gelatin, glycerine and glue, it gives the birds sticky feet, which discourages them from that particular building (biggest customer: U.S. government).

Like most animal nuisances, pigeons have been frightened, coaxed, trapped, and scolded, and statutes have been written against them. But again, as in the case of most animals, the only things that have really proved effective have been the chemical repellents. With these new tools people are learning that they don't have to take any more nonsense from some of their animal friends.

People, being human, find they like having the edge over the beasts, and are looking for still more ways to extend their control. One target, for example: nobody has yet figured out a repellent for snakes.



AUTO BAKE: Will a nonbake automobile paint put out the lights?

Outdating the Ovens

The brilliant new colors that gleam on '55 automobiles have been credited with creating part of the demand for the new models. But it has also created a headache for the automobile manufacturers, who must paint these rainbow-hued cars. The process has proved so vexing that there has been talk that dealers or distributors might end up doing the painting themselves, just before delivery. This week, Arco Co. (Cleveland, division of American-Marietta) is introducing the auto paint that may make distributor car painting fully possible—room-temperature-drying Arco 45.

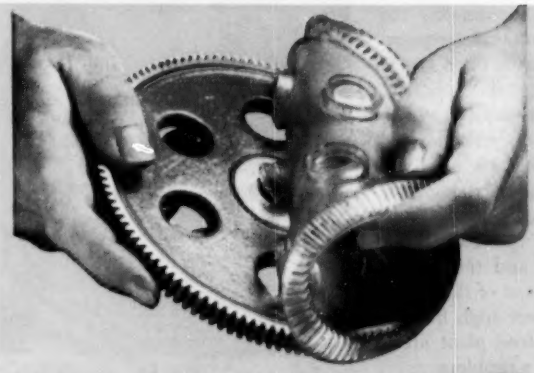
The new coating, already tested with selected auto finishers for over a year, is a high-luster enamel that sets dust-free in 15 minutes, dries completely in 45 minutes. It's now offered in the 15 most common colors but can easily be adapted to a variety of other tints, its maker says.

Cool Colors: With conventional automobile paints, both lacquer and enamel types, the sprayed-on coating is towed through special heating ovens (which heat the coating to about 300 F) where the coating receives an infrared bake. Such ovens are bulky, expensive. And when the dealer has tried to do without them, using previously developed "fast-drying" paints, there have developed twin problems of finding storage space for drying, and keeping dust from marring the soft finish.

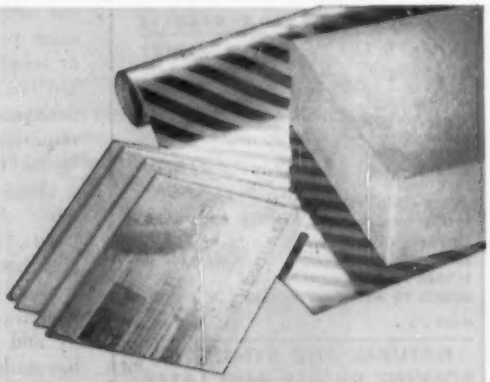
Arco 45, its maker says, eliminates all that. It can be applied with con-

CELLULOSE ACETATE
CELLULOSE ACETATE BUTYRATE

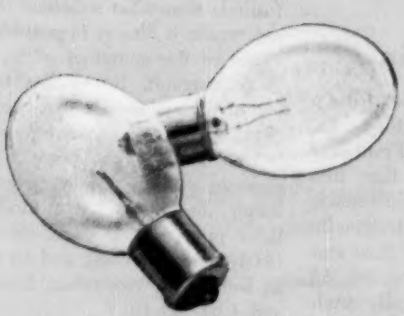
versatile film formers by Eastman



PEELABLE PLASTIC PACKAGING — Peelable plastic made with Eastman cellulose acetate butyrate is a clean protective packaging for fine tools, dies, gages, gears, machinings and many other metal parts. Applied as a hot dip, the thick, tough butyrate film cushions delicate parts against shock and protects them against corrosion and rust. When the part is ready for use, the transparent plastic skin is easily peeled off.



COATINGS FOR PAPER — Decorative and protective paper coatings made with Eastman cellulose acetate butyrate offer outstanding gloss. They are water white and do not discolor on aging. They retain high strength and flexibility at low temperatures, are heat sealable and are easy to apply either as a solvent solution or as a hot melt with existing commercial equipment. Mileage per gallon is high.



FLASHBULB COATINGS — When a flashbulb flashes, the sudden, intense heat sometimes fractures the glass envelope. Seeking a way to confine the broken pieces, flashbulb manufacturers turned to Eastman cellulose acetate. Applied in the form of a lacquer to both the inside and the outside of the fragile glass bulb, the tough, flexible acetate film provides an invisible jacket that serves to imprison the fragments of glass.

OUTDOOR LACQUERS FOR ALUMINUM — Lacquers made with half-second butyrate (Eastman's low viscosity cellulose acetate butyrate) promise a new kind of protection for outdoor aluminum surfaces. Half-second butyrate is a stable, dry powder. It is highly soluble in economical solvents. No other easily sprayable film former exhibits such a high degree of ultra-violet light stability, strength, flexibility and all-'round resistance to attack.

If you need a film to protect . . . to decorate . . . to seal . . . to cushion . . . to mask —investigate the cellulose esters made by Eastman. Eastman cellulose acetate and Eastman cellulose acetate butyrate are available with varying acetyl and butyryl contents in a wide range of viscosities. They are used in numerous formulations as special purpose coatings on metal, glass, paper, plastic, boxboard, foil and wood. For more information on the properties of Eastman cellulose esters call our nearest sales office, or write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

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ventional spray apparatus, and at room temperature (even in high-humidity areas) it will be "driveably" dry in less than an hour.

The new paint can also match its competitors pricewise. Arco is tagging the new product at approximately the same price as conventional lacquers, or roughly $1/gal. more than standard enamels. Further, Arco says, the new paint covers more area—an auto requiring 4 quarts of conventional enamel takes only 3 quarts of 45.

Quick Change: Right now, Arco, which also produces conventional auto paints, is supplying the coating to auto body refinishers and retouchers. It also plans development of the South American market, where high humidity and lack of dust-free paint areas has made car painting a problem.

From a safety standpoint, the new material is said to be "if anything, less flammable than a conventional enamel and certainly less flammable than a lacquer." In short, with a paint featuring the pluses of easy application, fast dry, and adequate safety, Arco figures its late-model coating will set the pattern for new auto paints.

Introductory Tie-in

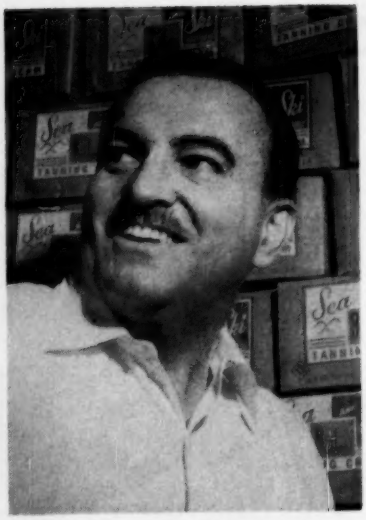
Still gaining sales momentum from a shrewd eight-week introductory campaign, Rolley, Inc. (San Francisco) last week began shipping East first runs of its Sea and Ski suntan lotion in new, 4-oz. plastic tubes. Originally slated for distribution in the East and Midwest last year (*CW, Dec. 26, '53 p. 42*), Sea and Ski didn't really catch on until Rolley combined a new package (the Bracon polyethylene tube) with a tie-in sales campaign (with Jules Montenier's Stopette deodorant).

Both Montenier and Rolley are congratulating themselves on the success of their promotion plan. Stopette got a new sales-talk point; Sea and Ski got a rousing send-off at no advertising cost.

The tie-in was a natural, Rolley points out:

- Both products are in polyethylene packages.
- Both are "class"-priced products.

Rolley provided Montenier with Sea and Ski; Montenier provided the ad campaign in magazines and on its TV show.



ROLLEY: Sales of his squeeze-tube sun lotion puts squeeze on production.

No More Bottles: Besides serving to introduce its new product, the plan gave Rolley a consumer test of the new tube pack. The lotion was formerly put up in glass bottles, but in long storage, the emollient in the formula somewhat solidified the product, made it almost impossible to get it out of the container.

As a result, Rolley has taken its products out of glass entirely, now packs exclusively in polyethylene. The flexible Bracon tube permits users to squeeze out everything, even if the lotion should solidify. Rolley has three polyethylene bottle sizes: 4 oz. ($1.19), 8 oz. ($1.98), and 16 oz. ($3), as well as the two tubes, 2 oz. (59¢), and 4 oz. ($1.10).

The firm claims phenomenal growth. Year-old plant in San Francisco, geared to turn out 2.5 million units/year (supposed to give a comfortable margin for expansion) is already bursting its seams. Distribution has begun in Canada, Bermuda, Finland, Switzerland. Sea and Ski is now the major Rolley product, but there are plans afoot for other cosmetics as well.

•

Sunny Pitch: Economics Laboratories, Inc. (St. Paul, Minn.) is now promoting its Ariel hair spray as containing a sun-screening agent. The anti-UV ingredient is claimed to prevent streaking and fading, while the lacquer gives a hair-setting effect.

Economics (and Raymond Labora-

Reilly reports TO INDUSTRY

From the Research and Development Division, Reilly Tar & Chemical Corporation
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We, the Reilly Researchers, appreciate the regularity with which you have asked about the availability of new compounds not presented in the Reilly Chemical Index.

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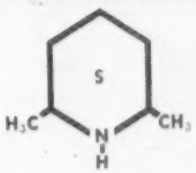
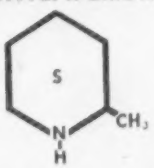


The steric effect of the methyl groups seems to make this a good stabilizer for organic halides.

2-METHYLPIPERIDINE



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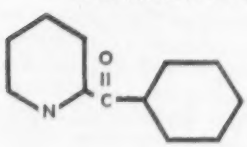
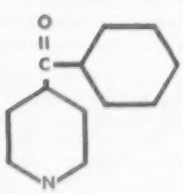


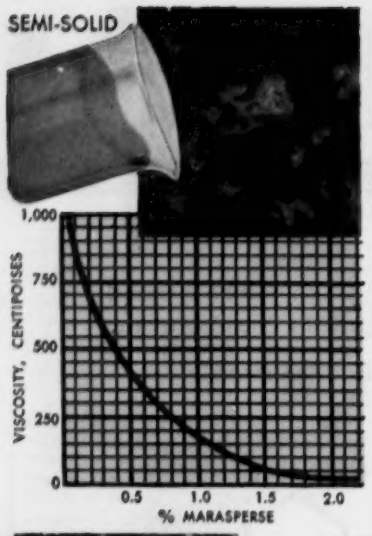
AND

4-BENZOYLPYRIDINE



Our friends tell us that the availability of these two pyridines will stimulate the synthesis of various compounds. We hope to make available other derivatives of benzylpyridine soon.

The Reilly Researchers



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tories, St. Paul, which is doing the aerosol loading) have presumably licked the problems that have kept sun-screeners out of hair sprays before: difficulty in finding an agent that works with hair (although many work on skin), and in finding one that will be effective when applied in the small doses recommended for most hair lacquers.

•

Paint Guard: Tremco Manufacturing Co. (Cleveland) is introducing a new rubber-base interior paint, Corosobar, for plant use. A butadiene-styrene coating, it is said to resist moisture, chemical fumes, acids and alkalis.

•

For Plastic Compounding: Chlorowax LV is a new low-viscosity secondary plasticizer developed by Diamond Alkali Co. (Cleveland) for compounding polyvinyl chloride resins. A modified liquid chlorinated hydrocarbon, it is said to have lower viscosity than conventional 40% chlorinated paraffins; it's also odorless, nontoxic, and nonflammable, Diamond says.

•

Mica Maker: Mycalex Corp. of America in cooperation with the Bureau of Mines and other government agencies, claimed to be the first synthesizer of mica—offers a compound made of synthetic mica for use in electrical insulation. Supramica is a ceramoplastic containing pulverized synthetic mica bonded with high-grade electrical glass. The new insulation, Mycalex claims, can withstand the effects of radiation and 1,000 F temperatures. Similar formulations using natural mica can withstand temperatures only to 700 F.

•

For Readers: Proceedings of the 41st annual meeting of the Chemical Specialties Manufacturers' Assn. (December, in New York) are now available. Along with committee reports and records of awards and citations, are included over 50 technical papers and reports. The 210-page, spiral-bound record sells for $7.50, U.S. and Canada, or $8, foreign, can be ordered from the Secretary, CSMA, 50 E. 41st St., New York.

• CSMA also has available a 52-page "Manual for Vendors and Fillers of Aerosols and Pressurized Packages." It includes industry-recommended manufacturing and sales practices in regard to labeling, premarketing product checks, filler safety, and postal regulations on mailing of pressurized packages. The manual, punched for insertion in standard three-ring binders, sells for 50c.

• "A Better Bond . . . For Organic Finishes," describes in detail the complete line of Turco Products, Inc.'s (Los Angeles) Turcoat phosphating compounds. It includes a chart showing, for each Turcoat material, the purpose, government specifications met, methods of application, equipment requirements, metals to be used on, coating weights, and complete operations cycle.

•

Who's Who: Hexachlorophene, and hexachlorophene liquid soap are listed in the latest (15th) revision of the *United States Pharmacopoeia*. Sindar Corp., maker of the hexachlorophene (tradenamed G-11), says it is the only antiseptic soap recognized.

DDT and Crabs

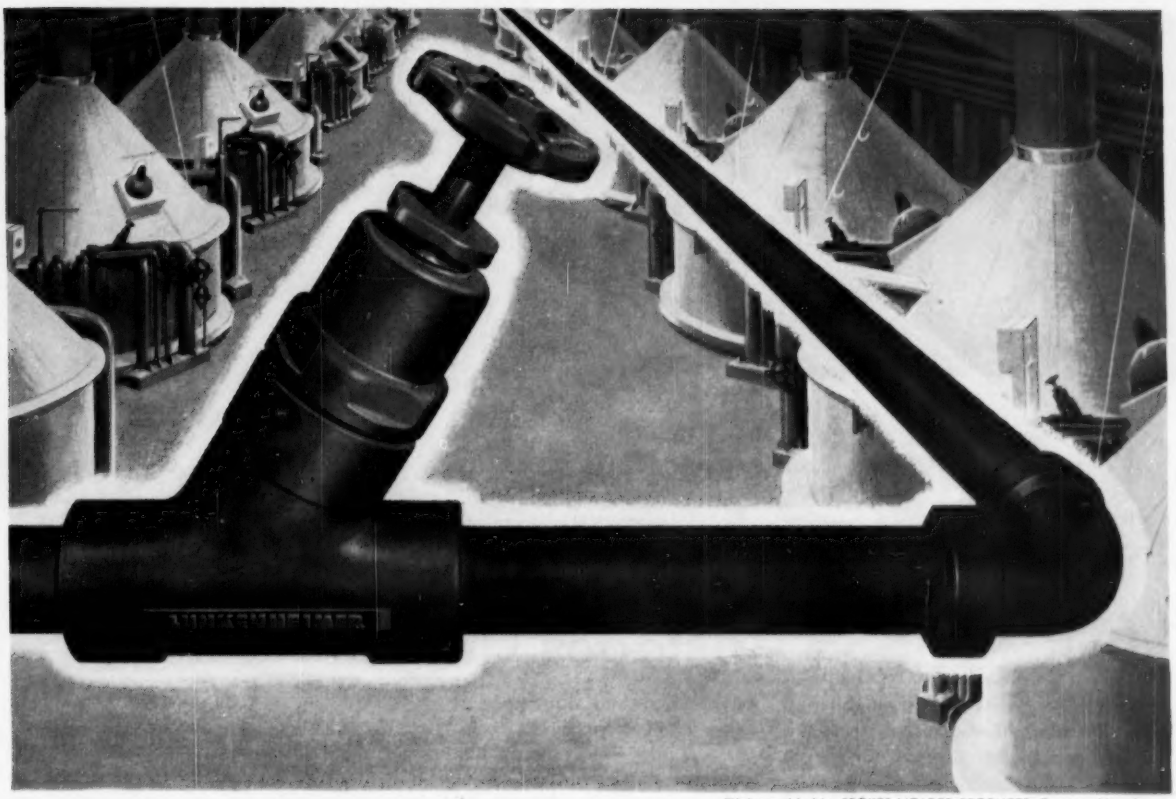
FAR UGLIER than it looks, the river crab *(above)* was recently proved to be host to tiny flies that carried a dread African scourge called river blindness. J. P. McMahon, of the Kenya Medical Dept. (holding the crustacean), not only proved that the crab was the carrier, but also worked out a way to stop the disease—DDT effectively killed the crabs. His work made it possible to reduce the incidence of the disease (from about one-third of all children under six, to virtually none), earned him the Order of the British Empire last month.

EXON: each resin engineered for a specific problem

EXON 402-A

specifically to wipe out

corrosion



*Valve molded by STOKES MOLDED PRODUCTS, Trenton, New Jersey

Millions of dollars are saved every year by American industry as unplasticized rigid PVC made from EXON 402-A wipes out corrosion. It has outstanding resistance to alkalis, acids, inorganic salts, and other corrosive fluids.

It outperforms, yet costs less than customary metals in many industrial applications. A tremendously important application, pictured above, is the new LUNCOR VALVE* engineered by The Lunkenheimer Co. It is the first all-molded PVC valve designed by a valve manufacturer.

Easier and less expensive to work with, unplasticized PVC made from EXON 402-A is strong but extremely lightweight compared with most metals. EXON 402-A is unusually versatile. It can be made into sheets, rods, tubes and other structural shapes. These can be cemented or welded... and are readily sawed, sheared, stamped, milled, drilled, planed and rolled on conventional metal or woodworking equipment.

For complete information or technical service on EXON resins, call or write Firestone.

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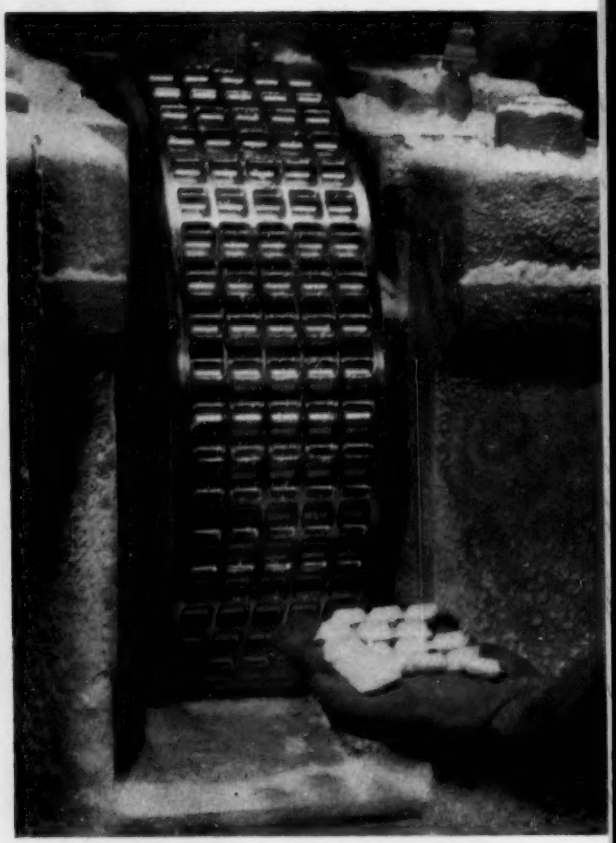
DIVISION OF FIRESTONE TIRE & RUBBER CO.

OLD . . .

Crystallization in pans took 5-7 days, required extensive floor space.



NEW . . . ➡

Pellet press slashes time, space requirements and impurities.

Pelletization Upstages Crystallization

There's no place in today's stepped-up production schedules for time-consuming processes that can't keep up with the fast pace. Crystallization by evaporation—one of the latest to feel the squeeze—has been edged out at Canadian Industries (1954) Ltd. (Hamilton, Ont., Can.) by a new pelleting process disclosed last week. CIL's switch to the short-cut method of crystallization was dictated primarily by the need for close size control of ammonium chloride galvanizer crystals; the product turned out by the old pan method didn't always conform to the customers' requirements.

Key component of the pelleting operation is a rotary press that compresses dry ammonium chloride into pillow-shaped pellets 1x$1\frac{5}{16}$x$\frac{1}{2}$ in. in size. This step not only obviates the introduction—and subsequent lengthy evaporation—of water, but also frees considerable work space. Formerly, crystallizing pans were tied up for 5-7 days per batch, required extensive floor area to provide adequate surface for optimum rate of evaporation. And since progress of the operation was determined, for the most part, by atmospheric conditions, there was no ready means for regulating crystal growth.

Better Product: Close control of crystal size is achieved by reducing pellets to specified size in a roll crusher. A gyrator screen completes the job by removing undesirable fines, which are returned to the pelleting press.

And CIL has found that the dry process eliminates several undesirable concomitants to handling ammonium chloride as a liquor. For one thing, equipment is subject to less corrosion than liquor pumps and lead-lined pans, which contacted the solution for prolonged periods. And there's no chance for the crystals to pick up lead as an impurity.

CIL is keeping other details of its operation pretty close to the vest. But it's fairly obvious that the rather simple change is paying off handsomely. For instance although the company is not talking about the time necessary for the new operation, undoubtedly it slashes appreciably the 5-7 days needed for the tedious process of growing crystals. Also, space requirements have not been pinpointed; but the rotary press pelletizer unquestionably occupies only a fraction of the space necessary for the pans in the crystallization method.

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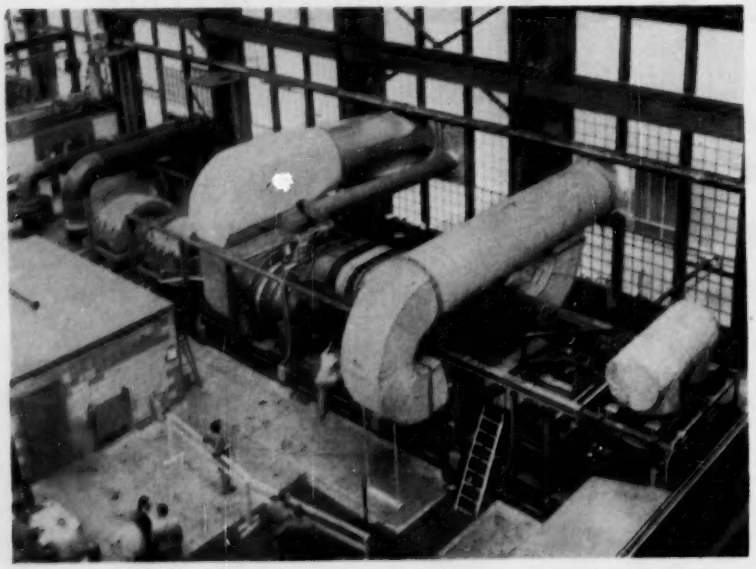

GAS TURBINE: Ready for mounting, it will soon be a . . .

Power Plant on Wheels

Clark Bros. (Olean, N.Y.), one of the Dresser Industries, took the wraps off its gas-turbine, mobile power plant last fortnight. Being built for the Navy, the power station is designed for emergency use. But Clark Bros. makes it clear that the plant's a heavy-duty unit that can operate continuously for an indefinite period. Though the mobility factor doesn't bulk too large for the process industries, the turbine itself may have significant process applications.

Rated at 5,500 kw., the plant is designated as the Turbo-Mobile Power Plant. It's completed now, ready to be mounted on a railroad car. It represents an investment of over $1 million on the part of the Navy's Bureau of Yards and Docks. But it should prove a bargain. Here's why:

As the arm responsible for technical control of the Navy's shore stations, the bureau must see that the proper equipment is operated correctly at these stations. Occasionally, of course, extra power is needed; and stand-by power facilities necessary to meet these peaks would cost a prohibitive amount.

Steam or diesel plants would also solve the problem; but a diesel plant of that power rating gets large and cumbersome, and a steam turbine—in addition to being somewhat larger than the gas turbine—requires a large quantity of water.

The Turbo-Mobile unit is expected to find application in areas like Mexico (where one has already been sold) that rely heavily on hydroelectric power. In case of a drought, something like the mobile units is most necessary. Clark Bros. is also pushing the plants as stand-by power stations in case of disaster.

Process Possibilities: Eventually, the firm feels, the process industries will be one of the best customers for the turbine—not as a stand-by unit but as a drive for centrifugal compressors. It points out that the process industries have taken to centrifugal compressors over the past five years, thanks largely to the availability of dependable, economic steam turbines.

Clark thinks they have not been used in gas transmission lines because of heavy water and maintenance requirements—objections that will be obviated by the gas turbine.

A big objection to the use of a gas turbine in a process plant is that it lacks the horsepower ratings needed to meet the diverse requirements. But this objection will become academic, the company feels, because of its design, which calls for an axial compressor, a single combustion chamber and a turbine. This can supply a gas at 1,100 F. that will operate one or more output turbines similar to the flow turbines used in nitric acid plants.

Jet Mining Pays Off

Conventional mining machinery will be as out of place as a pick and shovel in the gilsonite diggings soon to be opened by American Gilsonite Co. (Salt Lake City, Utah). The company, which will let contracts next month for the development of its 10-mile-long Cowboy Vein (near Bonanza, Utah), this week disclosed details of a novel method to be used in stripping, storing and shipping the light, friable gilsonite ore.

When AGC began considering plans for a $10-million coking project to produce high-grade coke and gasoline from the ore (*CW, June 25, p. 99*), the mining job posed several problems. For one thing, the company had to find an economical method of handling and transporting 600-700 tons/day of ore a distance of 80 miles to the coker. And for another, the material presented an unusual fire and explosion hazard.

Black powder, which was used in the early days, has long since given way to safer compressed carbon dioxide for blasting. But gilsonite is an excellent dielectric, tends to accumulate an electrostatic charge from the friction of dry air passing over it. Such a condition is believed to have been the cause of a fatal explosion two years ago.

Single Solution: AGC stumbled onto the answer to both of these problems when it looked into the petroleum industry's application of high-velocity jets for cutting coke out of barrels used in processing. The jet principle was adapted to tonnage production facilities and supplemented with a new method of handling the ore in water suspension. Here's how the mine will be worked:

The 20-ft.-wide Cowboy Vein will be tapped by an 800-ft.-deep shaft. This main shaft will contain: high-pressure water and compressed-air lines running to jumbos (mining machines); a 6-in. water flume running to the face of the drift; and a 30- to 33-in. steel flume through which the gilsonite-in-water suspension will be pumped to the surface.

To eliminate the explosion hazard, mining operations will be carried on in near-100% humidity. The two jumbos, mounting high-pressure water jets (2,300 psi. nozzle velocity) instead of conventional drills, will be

How to take the AH-CHOO *out of Benzoates*

You may have a problem that *used* to bother one of our customers.

Seems their production men began to complain of sneezes and sniffles.

The culprit? Benzoic acid dust, hanging in the air in the rooms where these men worked.

The dust wasn't hazardous. But it was bothersome, at the least—and could have become a real morale problem.

SOLUTION: At this customer's request, we developed a *bead form* of benzoic acid, technical.

These tiny benzoic acid beads keep their shape during handling, right up to the time they go into process.

RESULT: No dust. No more sneezes or sniffles. Happier production. And a gratified customer.

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You can also get *powdered* benzoic acid from us, in both technical and U.S.P. grades. It comes in 25, 50, and 100-lb. fiber drums.

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You can get the resulting clean, nondusting flakes in either U.S.P. or technical grade. (We can supply you with *powdered* sodium benzoate, U.S.P. or technical, too.) If you'd like data sheets, and trial samples of either form to check against your present supply, just write us or phone the nearest Hooker sales office.

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PRODUCTION . . . . . .

totally enclosed and equipped with telephone connections to main shaft hoist operator, pump-crusher station, and surface operations.

Gilsonite, ripped from the 10-ft.-thick walls, will be swept up by water pouring by gravity from the 6-in. flume. Water and ore will then flow through a V-shaped trough cut in the drift floor to the crusher station at the main shaft. Here, large lumps of ore will be separated from water and fines, crushed to the required ¼-in. size. Ore suspension will then be pumped to the surface, stored in two or three 30,000-bbl. surge tanks, which feed the 8-in. pipeline to coking works.

When lateral drifting is completed to prescribed length, jumbos will be moved back to the main shaft to begin a new 1-ft.-deep cut. Initial drifts will start about 70 ft. below the top of the vein. Main shafts will be put down every 1,000 ft., with man-way shafts being sunk when drifts are 500 ft. out from the main shaft.

AGC is gambling that the 16 million tons of gilsonite it controls (equal to 100 million bbls. of oil) can be exploited to produce fuel in economic competition with oil from drilled wells, and at less cost than that produced by mining and retorting oil shales. If the gamble pays off, as pilot operations indicate it will, the unique jet mining method can claim much of the credit.

EQUIPMENT . . .

Three in One: A precision measuring and calculating instrument, which combines the functions of a vernier caliper, depth gauge, and slide rule, is now being offered by Jet Air Engineering Corp. (San Diego, Calif.). Known as the Caliputer, the pocket-size stainless steel device provides direct readings of circumferences and cross-section areas, also permits simple calculation of other information.

•

LP-Gas Plants: American Liquid Gas Corp. (Los Angeles, Calif.) has developed a fully automatic, self-contained, packaged LP-gas plant for mixing butane or propane with air to produce gas of any desired Btu. content. In normal use, the units are designed to operate at pressures from 1-5 psi., independent of an outside source of power. Venturi tube mixers and vaporizer-mixers have capacities of 100-50,000 and 1,000-50,000 cu. ft./hour respectively; vaporizers are made in sizes from 40-800 gph.

•

Sludge Filter: To simplify the handling of industrial and municipal wastes, Komline-Sanderson Engineering Corp. (Peapack, N.J.) has developed the Coilfilter sludge vacuum filter. Eliminating use of filter cloths, the unit accomplishes dewatering with two layers of alloy steel coiled springs placed in corduroy fashion around a large revolving drum. Clogproof design assures constant peak-capacity output by standard Coilfilters providing from 85-500 sq. ft. of area.

•

Portable Pyrometer: The Land surface pyrometer, says Robertshaw-Fulton Controls Co. (Philadelphia), is the answer to many difficult temperature-gauging situations in the plastics molding, glass, and metal treating industries. Resembling a small microphone on the end of a telescopic arm, the instrument gives readings accurate to 0.5% in a range 100-2400 F. High accuracy is attributed to a near-perfect "black body" radiation principle, which measures heat at a depth of 1/16-3/16 in. rather than at the actual surface of a hot object.

•

Liquids Analyzer: Hard-to-separate samples of volatile compounds can be resolved both qualitatively and quantitatively with the aid of Research Equipment Corp.'s (Oakland, Calif.) Distillograph. Fractions in the boiling range of 20-350 C are separated by a helium gas stream flowing through packed column of oil-wet celite, detected by sensitive thermal conductivity cell, and automatically recorded on a strip chart.

•

Steam Generator: Cyclotherm Division, National-U.S. Radiator Corp. (Oswego, N.Y.), has just brought out a compact, packaged 40-hp. steam generator. The unit burns oil, gas, or a combination of the two; delivers 1,380 lbs. of steam (1,340,000 Btu.) per hour at standard design pressures from 15-200 psi.

•

Control Valve: Cochrane Corp. (Philadelphia) offers its new Hydromatic control valve for use with water treating equipment. Completely hydraulic operation utilizes main line pressure controlled by a pilot valve.

LEADING THE WAY

As they traveled through unfamiliar regions in their prairie schooners, the pioneer settlers of the western regions of America were faced with many uncertainties. For them, the journey was truly a voyage into the unknown.

Innumerable doubts and misgivings can be present, too, when you embark on an important expansion program, particularly when a decision must be reached on the selection of a process construction organization. There can be no turning back after the commitment becomes final.

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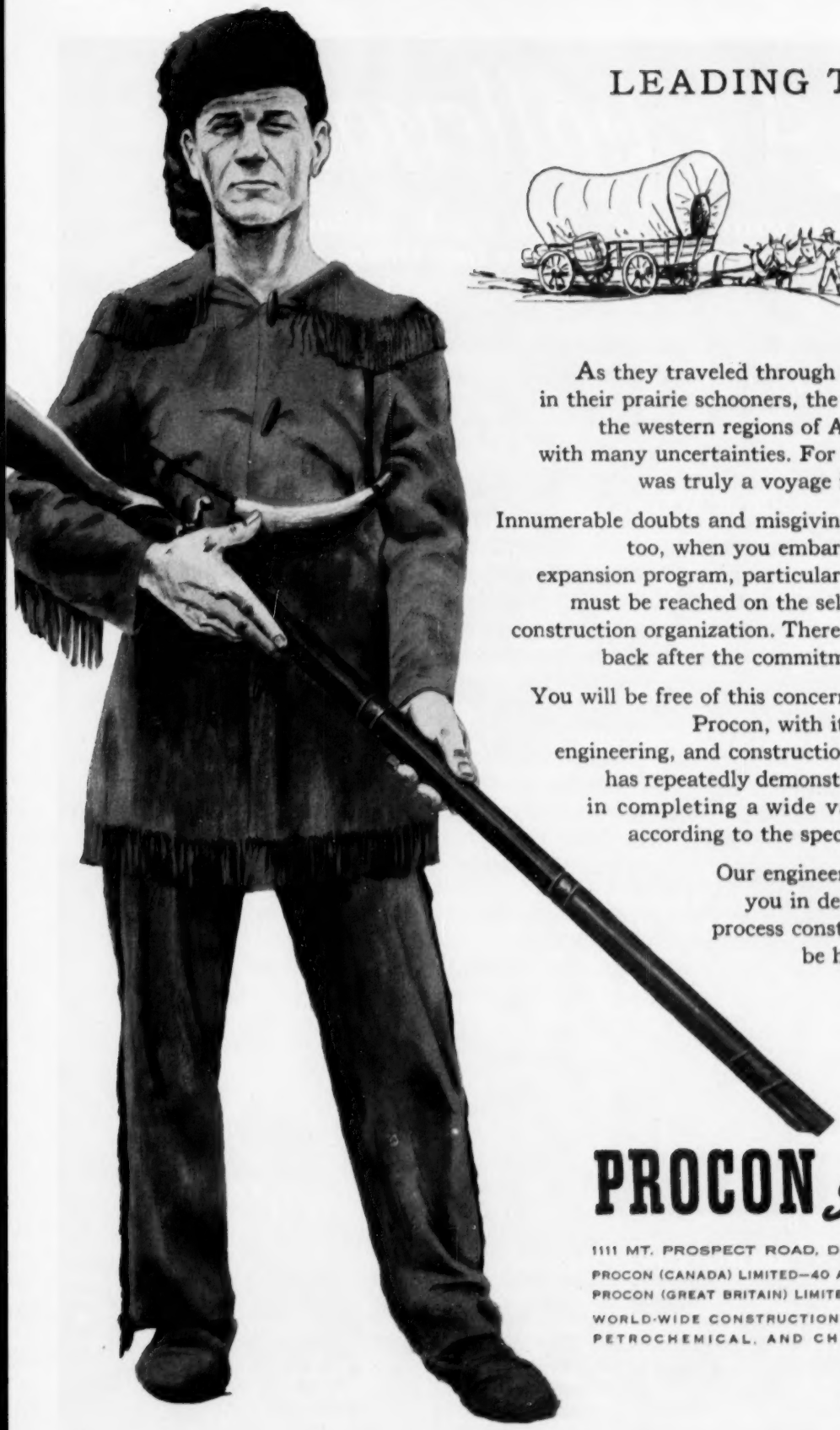
Our engineering staff can show you in detail why your next process construction job should be handled by Procon.



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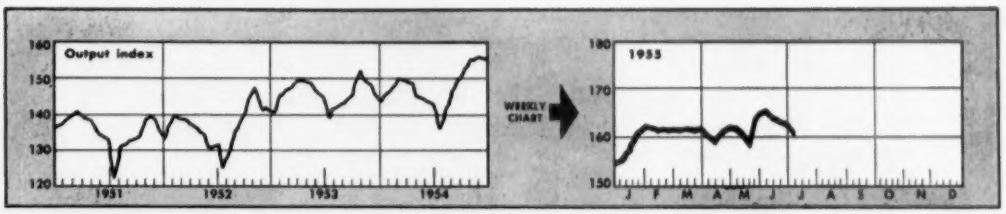
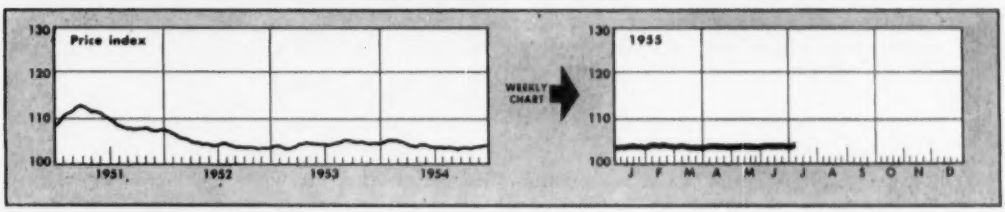
MARKETS . . . . . .





WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947-49=100)	155.1	161.2	135.8
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.3	104.3	104.1
Stock Price Index of 11 Chemical Companies (Standard & Poors Corp.)	459.6	494.5	322.0

MONTHLY INDICATORS—Trade (Million Dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$26,534	$26,025	$23,204	$43,533	$43,264	$44,335
Chemicals and allied products	1,953	1,912	1,592	3,019	2,943	2,930
Petroleum and coal products	2,308	2,284	2,170	2,673	2,658	2,785

MARKET LETTER

"Just about broken." Thus do summer-conscious chemical sellers descibe the thread of agitated price activity that hung on the third quarter's July 1 deadline. By this week, significant changes are scarce.

Stirring a measure of excitement in the pharmaceutical field, though, is Commercial Solvents' sudden slashing of riboflavin schedules. Cut on the USP grade of the vitamin B component amounts to $20/kilo., carries the gram price from 10¢ down to 8¢. The reduction, incidentally, is the first in more than 2½ years.

Actually, CSC's action may be a realistic move aimed at eliminating the few competitively shaded quotations some customers have been offered lately. Not all producers have yet followed suit officially, but it's almost certain the newer schedules will set the industry standard. Reason: business in general isn't slumping, but it could stand a lift.

•

Increased use nudging production is the stated reason behind this week's lower prices on some ethyl silicates. Carbide and Carbon-initiated reductions lop 2¢ to 3½¢/lb. off previous postings.

"Greater economies in manufacturing costs," says the major maker—and the savings are being passed on to consumers. New c.l. prices on 40% ethyl silicate and tetraethyl orthosilicate are 49¢ and 61½¢/lb., respectively; condensed ethyl silicate, c.l., is now 37½¢/lb. Quotes are for delivery in the East.

•

On the other hand there are price hikes in sight for some users

of boron products. Late last week Pacific Coast Borax jumped the field in posting higher schedules on borax, boric acid, and borates. The new tags go into effect Sept. 1, are announced now because of the 45-day-notice contract stipulation.

There's no indication yet whether the competition will move in the same direction, but chances are they will. Why? All producers have been hit with the same rising labor, fuel, raw material costs.

Here are some of Pacific Coast's new quotes: technical borax, anhydrous (99½%), up from $78/ton to $80.50 (bags, c.l., works); granular decahydrate, same basis, up $1.25 to $43.25/ton; boric acid in bulk, increased a like amount to $95.75/ton.

•

Down goes mercury—again. On a skid that has sellers hard put to keep pace, mercury prices continue to tumble. New prices ranging as low as $265/76-lb. flask are some $60 under the high quoted a short while ago.

Tip: no one seems certain the bottom has been reached. This probably explains why consumers are still on the sidelines, slow to act.

•

Despite the cuts in mercury metal, derivative prices at the moment remain pegged at relatively high levels.

Mercurial makers are on a spot. Current high prices have pinched sales; hence producers, as well as consumers, would relish some reductions. The big deterrent to a drop, however, is this: manufacturers have ample inventories of mercurials made with high-cost metal. These stocks, many feel, should be cleared out before any price changing takes place.

But—and it's a big one—demand, others say, has been dragging so badly of late that the cart, in this case, should be put before the horse.

•

U. S. ethylene production capacity continues to gallop upward. One estimate: some 3 billion lbs./year within the next half decade or so. Gulf Oil, contributing to the swelling, last week completed and snapped into operation a second big ethylene unit at its Texas installations.

The new plant (said to be the largest of its type in the world) is designed to turn out about 220 million lbs./year—more than double Gulf's previous ethylene capacity. It will add about 10% to the nation's potential.

Feed stock for the unit: cracked refinery gas and propane—both produced at the same Port Arthur location.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending July 18, 1955

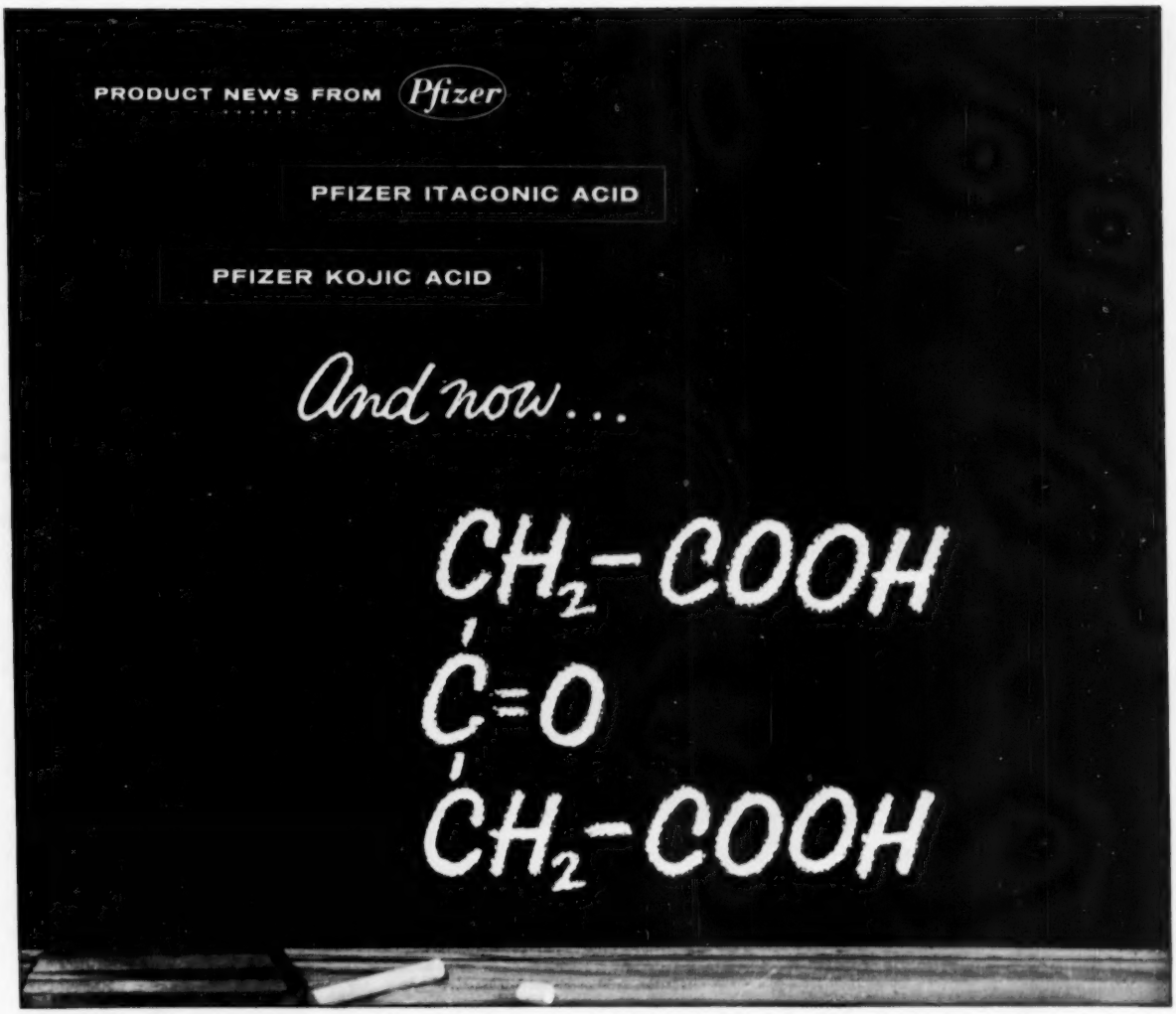
UP

	Change	New Price		Change	New Price
Oleic acid, s.d., tanks	$ .005	$ .16	Stearic acid, dbl. pressed, bgs.	.005	.1475
Stannous sulfate, dms., works	.012	.9530	Tallow acid, dist., dms.	.005	.1475

DOWN

Ethyl silicate, 40% avail. SiO_2, dms., c.l., dlvd.	$ .03	$ .49	Riboflavin, USP, bots., dlvd., kilo	20.00	80.00
Mercury metal, 76 lbs. per flask, net-flask	7.00	268.00	Tetraethyl orthosilicate, dms., c.l., dlvd. E.	.025	.6150

All prices per pound unless quantity is stated.



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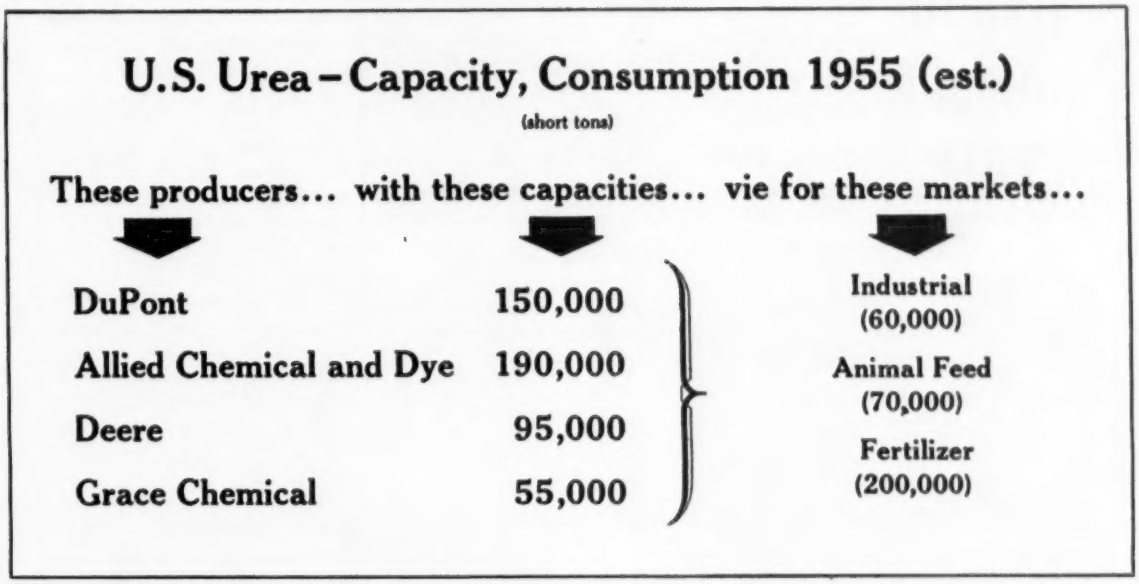

UREA CAPACITY: Four firms now in production; three making ready; at least two pondering the plunge.

Poser for Producers: Too Much Urea?

Is it worth several million dollars to move into the urea producing business? By this week it's apparent that even some of the top chemical companies are at variance on that question. For example, on the one hand, American Cyanamid has withdrawn a $7.5-million application for a urea plant; on the other, Shell Chemical is going ahead with plans to put up the first such installation on the West Coast.

Cyanamid's decision to bring its embryonic urea enterprise to an abrupt halt reflects the consensus of chemical marketers that U.S. production capacity will soon be more than ample. Says Cyanamid: a new urea plant—now, at any rate—does not offer the best potential return for investment dollars.

Meanwhile, Shell Chemical's study of the same competitive scene led to a different answer. Shell's recently (*CW Market Letter, July 16*) revealed plan—involving Montecatini, Italy's chemical colossus—calls for a 100-tons/day urea plant to be erected at Ventura, Calif.; it's to be completed in time for the 1956-57 fertilizer season.

Why the business looks good to Shell and not to Cyanamid is one of those difficult-to-answer questions. But Shell is not alone in figuring that the pros far outweigh the cons of urea production.

Makers Multiply: Du Pont, once the only producer in this country, now faces plenty of competition. For example, an estimated 1955 production of 130,000 tons by Allied Chemical & Dye falls short of Du Pont's output by only 20,000 tons; furthermore, when Allied reaches full production of 190,000 tons/year—about 85,000 tons at South Point, O., and 105,000 tons at LaPlatte, Neb.—it will top Du Pont's capacity of 150,000 tons/year by 40,000. Hence, Allied's entry into the urea business has more than doubled U.S. production capacity of the chemical.

Others, too, are swelling the tonnage at a rapid rate: Deere's 95,000-tons/year plant at Pryor, Okla., will turn out about 32,000 tons this year; Grace Chemical plans delivery of 13,000 tons in '55 from its new 55,000-tons/year plant at Memphis, Tenn. All told, these four producers are expected to pour an estimated 325,000 short tons of urea into the market this year, have plant facilities for a total production of 490,000 tons/year to meet future demands.

Present, but not accounted for, productionwise, are several newcomers; at this stage their combined production capacities are difficult to judge, but some market observers are talking about 620,000-ton total schedules for '56, or '57 at the latest; furthermore, this estimate does not take into account output of Shell or Thunderbird Corp.'s proposed installations.

Thunderbird's $13-million ammonia and urea plant, to be located at Kyrene, Ariz., is slated to leave the drawing boards in early fall. It is time-tabled for completion about June, 1956.

Standard Oil Co. of Ohio, now putting finishing touches on an ammonia plant in Lima, O., is also rushing a urea unit that's due to be in operation by Jan. '56. Sohio Chemical Co., a newly formed subsidiary, will handle sales.

Reports periodically filter in from the Northwest about two more potential producers: Canada's Consolidated Mining and Smelting Co. (Cominco) may build a plant somewhere along the Columbia River in Oregon, but the firm seems in no great hurry to translate its plans into action. Columbia River Chemicals has a plant site at Pasco, Wash., but also appears to be reining enthusiasm for the time being.

With four companies now onstream, three shoving off, and several others at least splashing water, other would-be producers are beginning to find the urea tributary a little crowded.

However, there are reasons for viewing the urea future with considerable optimism. Not the least important is the belief that a loosening market

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0.1% aqueous solution at 25°C ..... *4 to 6 sec.*

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0.1% aqueous solution at 25°C ..... *9 to 10 sec.*

Surface Tension, 0.1% aqueous solution at 25°C ..... *25.9 dynes/cm.*

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followed by an easing of prices is a necessary stimulus for expanded use of urea industrially (plastics, etc.), in animal feeds, and especially in fertilizers.

Fertilizers Favored: Fertilizer, today, is urea's top market, and will undoubtedly continue as such for a long time to come. Although accurate figures are difficult to compile in so rapidly changing a market picture as urea consumption, most market analysts agree that 200,000 tons is a reasonable estimate of its 1955 fertilizer use. Even at that, growth of the application has been retarded considerably by prices a little too high to compete to best advantage with other sources of nitrogen.

Something to watch will be airplane spraying of rangelands—a technique due for big developments. Air application of fertilizer is said to have doubled during the last year, but so far most activity has been in New England, where rough terrain and many orchards make spraying from airplanes particularly effective. Urea advantages being touted: a relatively low weight per unit of nitrogen, and negligible burn-effects on foliage.

The over-all market potential for urea can be envisioned, in part, by noting the potential of all fertilization. During the 10-year period between 1945 and '54, the consumption of all plant foods doubled, and dollar sales increased by a factor of 2.6. The growth occurred although only about a quarter of all crop lands in this country received the benefits of fertilization, and often less than optimum amounts of fertilizers were used.

Feed Bite: Next to fertilizer, the fastest-growing use of urea is for animal feed. Volumewise still far behind the former, its consumption in feed nevertheless exceeds amounts now used in strictly industrial applications, such as plastics.

Beef cattle alone consume urea at the rate of 35,000 tons/year, and the figure can be doubled if all ruminants are counted. Admittedly, the quantity at present is small compared with the 200,000 tons/year that go into fertilizers, but there are many reasons why feed uses should make big advances in the next few years.

Cattle, sheep, and other ruminants can use synthetic urea as food in amounts up to one-third their total protein requirements; consequently,

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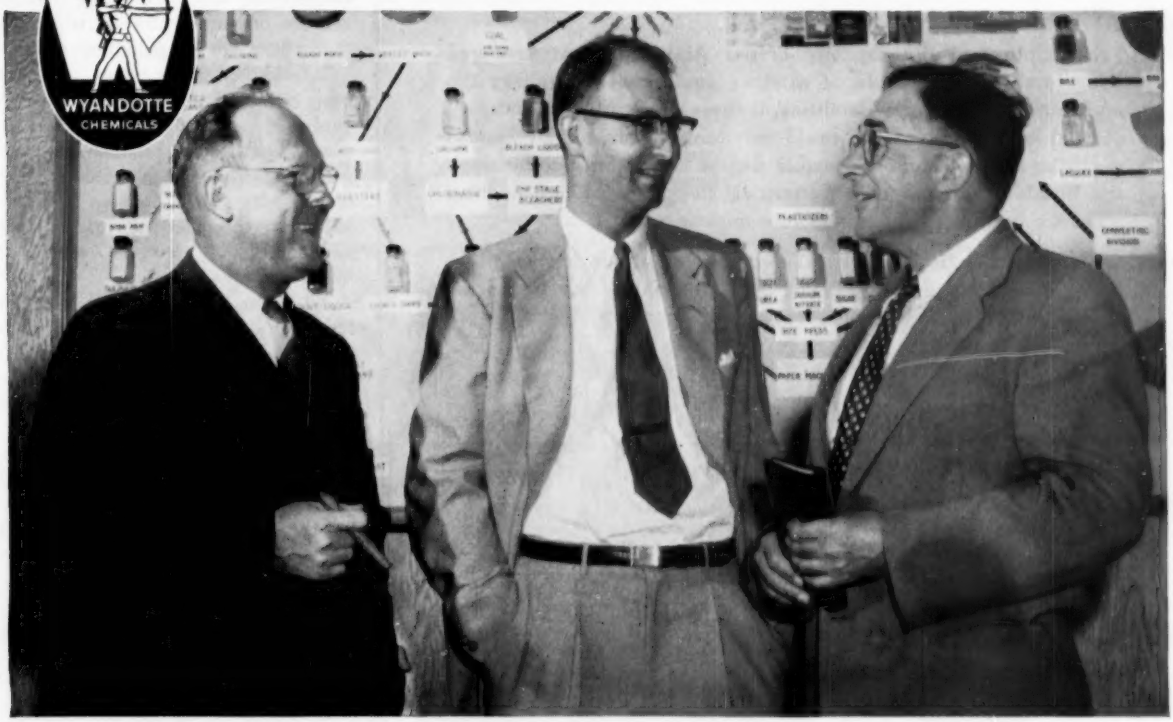

R. E. Harper (left), director of purchases, and William R. Haselton, Rhinelander's manager of manufacturing, talk over chemical needs with Wyandotte Representative J. C. Mills.

"Wyandotte has been an outstanding supplier of chemical raw materials"

— R. E. Harper, director of purchases, Rhinelander Paper Co.

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With such an operation, you would expect Rhinelander suppliers to be hand-picked — and they are. The formula is clear-cut and concise. As R. E. Harper, Rhinelander's director of purchases, states: "We are proud of all our suppliers. They are a continuing factor in our success. Wyandotte has been an outstanding supplier of chemical raw materials to us for more than 10 years, and for just two reasons: dependability and service. We currently buy Soda Ash, Chlorine and Caustic from Wyandotte.

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Provisions for expansion, contained in Ferguson's original design, made easier the erection of this ¼-mile-long and 180-foot-wide addition to the Courtaulds (Alabama) Inc., plant near Mobile, Alabama.

Ferguson industrial engineers and builders have applied their skills to three projects in three years, to produce Courtaulds' vast, ultra-modern rayon staple plant, near Mobile, Alabama.

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farmers can use more of the cheaper sources of carbohydrates, which, in themselves, are low in protein content.

In addition, lower prices, as in the case of fertilizer, will undoubtedly stimulate use of urea in feed. For instance, competition between urea and ammoniated molasses as feed supplements may well become rougher. Why? At the moment, price of the ammonia-spiked feed is somewhat under the urea feed tag.

Add, too, the likelihood that attractive price schedules on U.S. urea could bring about a decided turnabout in consumers' buying, switching more of them from imported material to domestic feed-use urea.

Plastic Prophesies: Industrial application of urea—with an estimated total consumption of 60,000 tons in 1955—now trails both fertilizer and animal feed uses. The major portion of industrial urea consumption goes into plastics; and it is probable that any big increases, if they come, will be in these same or related uses.

Manufacturers of urea resins have long been disturbed by the relatively small annual increases in urea-formaldehyde consumption; consequently, some are now planning promotional campaigns to spark new life into the business. Too, one manufacturer hints about formulation "aces-up-the-sleeve" and predicts a doubling of urea-formaldehyde production in the next five years.

At least the possibility of a new era in urea-formaldehyde is suggested by changes that have been taking place in end-use patterns since 1950. The most important applications have been for bottle closures, buttons, electrical plugs, and other small items. Now however, the trend is said to be toward the fabrication of larger objects, notably radio cabinets and other housings.

While most market analysts are betting on the sure winners—fertilizer and animal feed—resin manufacturers optimistically insist that the increase in consumption of urea by plastics (from 41,000 tons in 1952 to 55,000 tons this year) is only the beginning.

But regardless which outlet will more significantly alter urea's end-use pattern, accord is general that total consumption will grow. Only question now—and one bound to pop up again and again—is this: Will demand soon match capacity?

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FIG. 3059G—300-Pound Steel Flanged End Valve. Sizes 6″ to 12″.

FIG. 1559—150-Pound Steel Flanged End Valve. Sizes 1″ to 4″.

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The Wm. Powell Company, Cincinnati 22, Ohio.....109TH year

CHOOSY BUSINESS: Sales and advertising executives pick shows, mull over themes with design and exhibit men.

Displays At Work

Riddle: Where can you find thousands of potential customers, most with serious intentions, and all congregated in the same place at the same time? Answer: industrial expositions—a medium that's becoming more and more the industrial marketing place of the nation. Right now, the number of trade shows is pegged at somewhere over 3,000 compared with about 800 two decades ago.

Naturally, chemical companies, too, are cashing in on the popularity exhibition selling now enjoys. Chemical makers can even be found at such unobvious spots as conventions sponsored by railway supply and lubrication engineer groups. A fair number of firms are trying out international trade fairs (*CW, April 9, p. 58*). At home, to cite but one example, Du Pont plans participation this year in about 200 exhibitions. Only two years ago, the company took part in 98 shows.

Behind the eye-stopping display on a crowded convention floor is much planning, skill, and hard work. How much? This week, *CW* got the answer when it visited Du Pont's exhibit headquarters* in Wilmington.

Organization: Part of the advertising department, the exhibit section circulates a list of shows to advertising and sales managers 6 to 12 months in advance. Together, the managers jointly decide which shows to enter. Then, about 100 days before showtime, people from exhibits, design, advertising and sales sections meet to pick a theme. The average display usually has one main theme and several corollaries.** Next, a timetable for the exhibit's production is drawn up.

The advertising manager prepares concept and text for the displays; designers whip up sketches from this and from notes taken at the planning meeting. Once sketches are okayed, the exhibits section takes over, much subsequent responsibility falling upon its project supervisors.

Supervisors solicit bidders, award bids, inspect work, arrange shipment, and oversee installation. "And we must come out on time with our best foot forward" observe Lynford Alexander, head of the exhibits section, and Carrel Skeen, head of industrial displays.

Cost and Economy: Display expense varies considerably. Sometimes Du Pont can do nicely on a few hundred dollars for a small exhibit; other times,

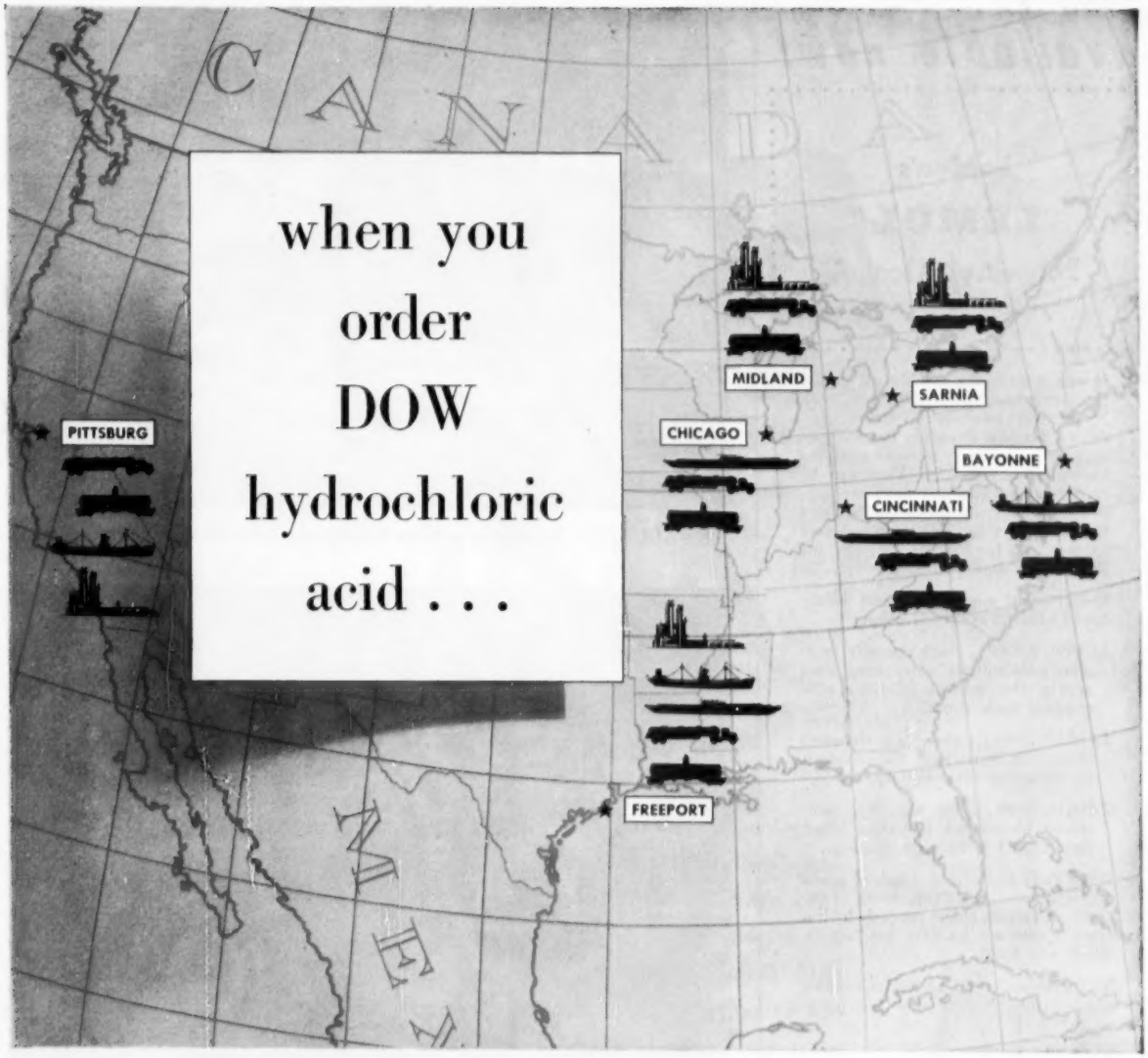
* To report on industrial or trade shows, Du Pont also prepares consumer exhibits and maintains a permanent display in Wilmington.

** At the recent National Packaging Exposition in Chicago, the main theme was "How the company serves the packaging industry." Corollaries included packaging with Freon propellents and how Alathon polyethylene resins are engineered for packaging.

CREATION: Designer turns abstract theme into blueprints for sales.

QUALITY CONTROL: Supervisor inspects work at contractor's shops.

DOW



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CHEMICAL DIVISION

AT FAIR SITE: Supervisor advises installation crew on finishing touches.

BIG DAY: Against display backdrop, selling company and products.

tens of thousands can go into a colossal production. A 10-ft. booth and display now runs in the range of $300-3,000. But costs can be sliced without shaving quality:

• Show reuse. When convention groups have allied interests, essentially identical shows can be used. Thus dentists and X-ray technologists could both view similar photo products. About 58% of Du Pont's trade exhibits this year will be used more than once, essentially without change.

• Parts reuse. Wherever practical, parts such as background frames, pumps, lights, motors, etc., are salvaged to lure customers another day. A bulging warehouse is kept in Wilmington for show parts. Occasionally, a new show may be created from old panels with little more than fresh wording. Currently, the exhibit department is using matched furniture and rugs and standard parts like tiles

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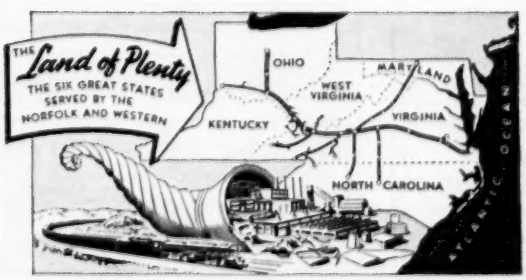

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Eastern sales agency now handling plastic and rubber machinery wishes to expand into heavy chemical processing and control equipment. Especially qualified for intricate organic processes requiring skillful technical presentation. Small staff now selling over $500,000.00 annually for one customer. For confidential interview please write:

RA 7042 Chemical Week
330 W. 42 St., New York 36, N. Y.

chemical process industries

EMPLOYMENT

Position Wanted

Market Research B.S. Agric. Econ., age 28, 4 years experience agricultural chemicals, wishes to utilize his intensive curiosity and background for a company active in exploring new opportunities in the chemical process industries. PW-7056, Chemical Week.

EQUIPMENT--used-surplus

For Sale

Conkey Triple Effect evaporator, total 1900 sq. ft. copper tubes. Unused. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

Sharples Centrifuge 16P Pressure—Tite Stain-less Steel, Ser #47161109, Type M-12-B-16, 1XY-52; explosion proof motor, unused. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Blaw-Knox ½ gal. Stainless Steel Autoclave, 2000# pressure. Perry Equip. Corp., 1415 N. 6th St., Phila. 22, Pa.

Tanks Aluminum 8—8000 gal ½ in. Lestan Corp., Rosemont, Penna.

For Sale. S/S Kilby #12 filters. S/S Sweetland #12 filter. Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N. Y.

Wanted

Wanted to Buy—Vertical, Niagara type pressure filters. Approximately 200 sq. ft. filter area. Stainless steel leaves. Stainless steel or rubber lined jacket. National Lead Co., St. Louis Smelting and Refining Division, Metals Refinery, Fredericktown, Missouri.

CHEMICALS WANTED

BUYERS OF SURPLUS

CHEMICALS—OILS—SOLVENTS
DRUGS—RESINS—WAXES
PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.
75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS, RESINS, DYES
SOLVENTS, PIGMENTS, ETC.

CHEMICAL SERVICE CORPORATION
96-02 Beaver Street, New York 5, N. Y.
HAnover 2-6970

SURPLUS WANTED

Chemicals—Resins—Pigments—Solvents
By-products—Mixtures
Specializing in off spec materials

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70 Dod Street, Elizabeth, N. J., EL 4-7654

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Distillation, Extractions
Separations, Fractionations
WANTED All Types of Crude Mixtures
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Contaminated Solvents
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We are interested in excess Hydrogenation capacity, with top quality technical supervision. Bzura, Inc. Clark Street and Broadway, Keyport, N. J.

Contract Work Wanted

Manufacturing Facilities

CONTRACT PROCESSING FACILITIES
for
Edible or Fine Chemical Products

- Evaporating
- Crystallizing
- Centrifuging
- Rotary or Spray Drying
- Screening
- Milling

Top quality control by technical supervision.
Up-State New York location.

CWW 6454, Chemical Week
330 W. 42 St., New York 36, N.Y.

Packaging Facilities available in the South. Complete automatic liquid, paste and powder filling. Warehousing and shipping. Centrally located, 15 acres. Ideal location. Experienced personnel. Whittemore Bros. Corp., Fayette, Alabama.

BUSINESS OPPORTUNITIES

SALES DEVELOPMENT

OVERSEAS MARKETING

Have you any specialty products for the surface coating industries which you consider could be marketed in Europe or the Commonwealth if they had adequate technical sales backing?

A British manufacturer of synthetic resins operating one of the most modern plants in Europe would like to discuss sales arrangements with a view eventually to manufacturing under license in the United Kingdom. Extensive technical service facilities and a trained sales force offer an unusual opportunity for sales development, particularly for products which require technical backing.

Please contact:

Cray Valley Products Ltd.,

St. Mary Cray, Kent, England.

WANTED

A GOING CHEMICAL COMPANY.

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BO-7088 CHEMICAL WEEK
330 W. 42 St. New York 36, N. Y.

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the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

DISTRIBUTION. . . .

that lock together. This will allow quality designs as well as savings.

Problems: Biggest headache is that of integration—getting parts lined up, sketches finished, shipments made on time, etc. The timetable and a scheduling board helps here. But there are other worries:

- Show catalogs. Current directories don't cover all conventions.
- Exciting the audience. Motion, light, color, water, buttons to push, all help stir interest, but . . . as Skeen puts it, "You never know till the show opens." "Plenty of products and plenty of information" is a trusty formula, claims one veteran Du Pont display man. Generally, the company soft-pedals give-aways, likes to have spectators write in for literature. Direct mail and notices in regular advertising help promote the show.
- Value measurement. Quantitative determination of a shows value or the effectiveness of specific techniques is hard to measure. Most display know-how is now "rule of thumb." Skeen would like to see some analysis along this line.

Pros and Cons: Besides the purchase-minded, interest-screened audience, which shows afford, other advantages abound:

- Expositions offer personal-contact selling. Only regular sales calls do the same.

THRIFT: Salvageable parts can be used again, are returned to storage.

• Displays offer latitude. Products can actually be shown—not just described. Too, all five senses can be appealed to.

• "Market feel" is provided. Often, people from all over the country attend and their comments reveal trends. For this reason, company executives often work alongside salesmen in the booth. Like anything else, exhibits have their limits. These include:

• Few outlets. If there are only a few possible customers for the product, shows are unsuitable, too costly.

• Unfrequency. Usually once-a-year projects, expositions don't provide continuity of contact.

• Timing. Shows don't always match product development and availability.

• Consumer products. Radio, TV, newspapers, etc., reach audiences for less money per contact.

Planning and problems, work and cost—all bring in the crowds (Du Pont expects some 2 million this year) and sales. And that is why Du Pont—albeit selectively and judiciously—goes expositioning.

•

For Tomorrow's Reference: Itaconic acid esters—9-p. booklet contains information on chemical reactions, physical properties, molecular structures, polymerization and specifications. Chas. Pfizer & Co. (Brooklyn).

• Molding compounds — Barrett Division, Allied Chemical & Dye Corp. (New York), is offering technical bulletins on nylon and alkyd molding materials, describing physical and chemical characteristics.

• Plastics fair—official catalog lists exhibits, equipment, products and various applications of plastic material that will be displayed at the World Plastics Fair and Trade Exposition in Los Angeles, Oct. 5-9. Exposition Office, National Guard Armory (Los Angeles).

• Price list—gives latest prices for essential oils, fixatives, naval stores, etc. Fritzsche Bros. (New York).

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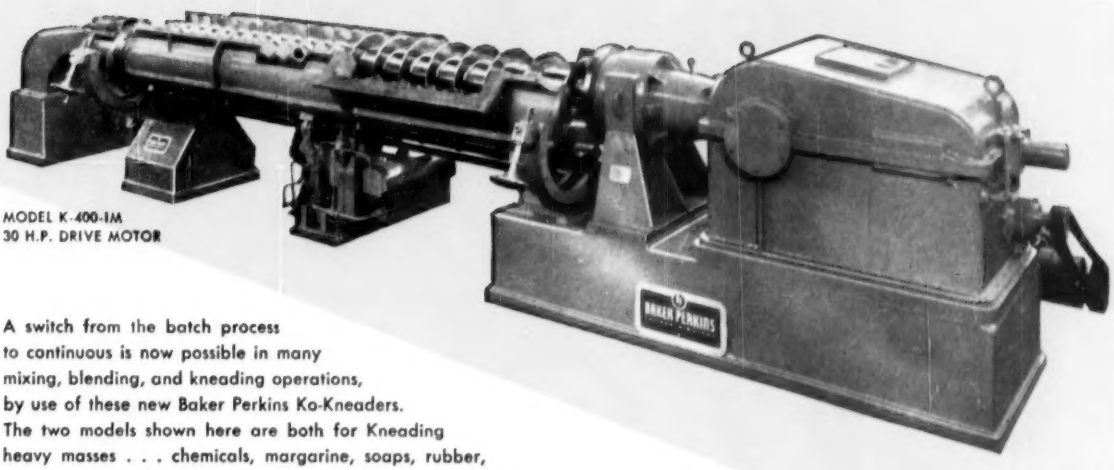
Two more BAKER PERKINS continuous-mixing KO-KNEADERS

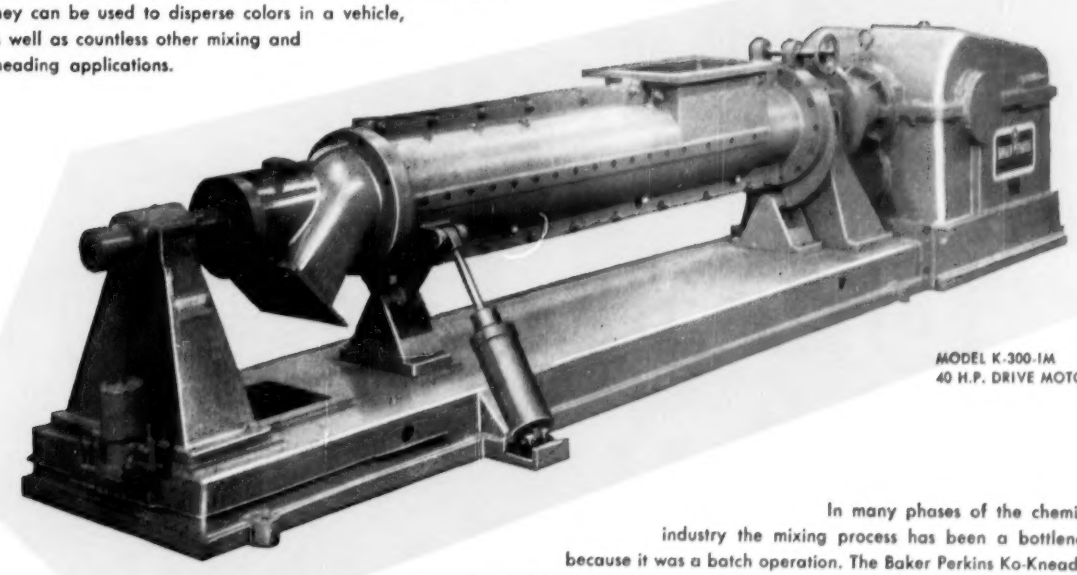
(LIST SYSTEM)

now on the job



MODEL K-400-1M
30 H.P. DRIVE MOTOR

A switch from the batch process to continuous is now possible in many mixing, blending, and kneading operations, by use of these new Baker Perkins Ko-Kneaders. The two models shown here are both for Kneading heavy masses . . . chemicals, margarine, soaps, rubber, and plastics such as polystyrene, PVC, polyethylene, or acetate. They can be used to disperse colors in a vehicle, as well as countless other mixing and kneading applications.



MODEL K-300-1M
40 H.P. DRIVE MOTOR

In many phases of the chemical industry the mixing process has been a bottleneck because it was a batch operation. The Baker Perkins Ko-Kneaders break this bottleneck by converting to continuous mixing. When installed with the proper feeding and output handling equipment, these Ko-Kneaders make mixing largely automatic, and result in a better quality product along with savings in production costs.

BAKER PERKINS INC.

303

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from "Royal Water"

to Rocket Motors

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Sp. Gr. 1.42

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